

Europe's microtechnology industry is attuned to growth

Global economic, social and political developments as well as technological disruptions like the digital transformation do not leave the representatives of the European microtechnology industry unaffected. Nevertheless, growth forecasts for the next three years are distinctively positive. More than 80 percent of the companies expect to increase sales in the period from 2017 to 2019. The number of employees is also expected to rise in more than three-quarters of the companies. However, securing skilled workforce remains a challenge for more than half of the microtechnology companies.

Increasing growth rates during the last four years are likely to have given rise to this optimism in the microtechnology industry: since 2013, the share of companies that have been able to increase their turnover and their number of employees has risen steadily. In 2016, more than half of the microtechnology companies (56.3 %) achieved an increase in sales. Almost half (47.7 %) of companies hired additional staff last year.

Development of turnover: turnover has / will ...

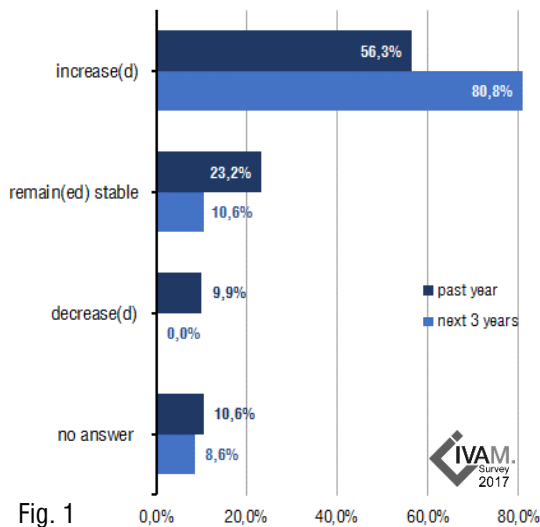


Fig. 1

Development of staff: staff numbers have / will ...

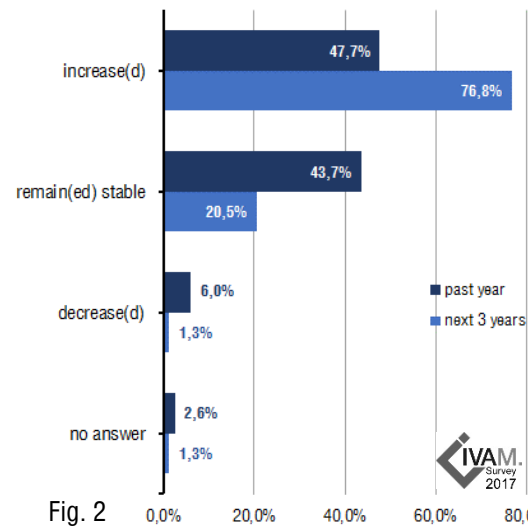


Fig. 2

China is expected to outrank the USA as major overseas trading partner

The export business of the European microtechnology industry will also continue to improve over the next three years. More than half of the companies expect that the share of turnover generated by exports will rise during this period. Overall, export shares especially in Germany are lower in the microtechnology industry than in other sectors. The microtechnology industry nevertheless contributes to the high export surplus of Germany, being a supplier to those industries that produce the main export goods: the automotive industry, the chemical industry, mechanical engineering and the electronics industry.

Consequently, trade in European microtechnology products still predominantly takes place within Europe. The EU and the European Free Trade Association (EFTA) are the most important sales and export regions for more than half of the European companies. The USA is the most important overseas market, still. This is likely to change over the next three years: during this period, China – currently one of the EU's fastest growing export markets – is expected to outrank the USA as the most important overseas trading partner for European microtechnology companies. [Figure 3, page 2]

One factor that might slow down this development is the uncertain economic growth in China. Nearly 17 percent of the microtechnology companies regard this as potentially problematic. However, a stronger uncertainty factor for Europe’s microtechnology industry regarding China is the growing competition for high-tech “made in China”. [Figure 9, page 4]

Oppositely, the new protectionism in the US economic policy is a factor that might make the US market more difficult to access and give China a growing advantage. The walling-off of the US market enforced by the Trump government worries more than half of the European microtechnology companies. The possible failure of TTIP, on the other hand, alarms less than one-tenth of the companies. [Figure 9, page 4]

Which is / will be your major export region?

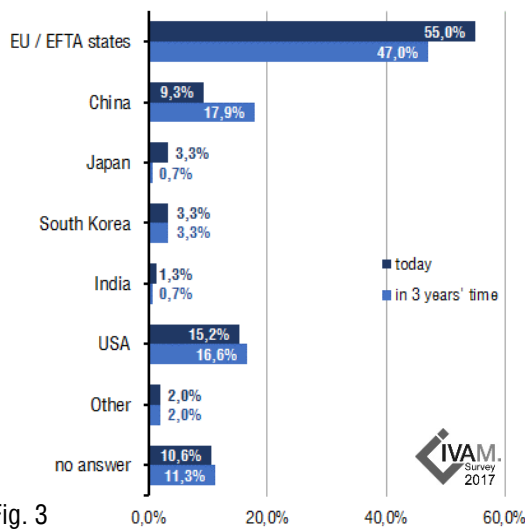


Fig. 3

Which is / will be your major target market?

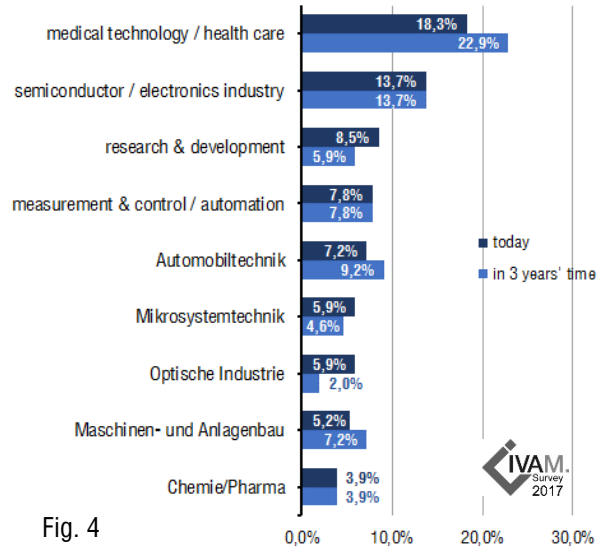


Fig. 4

Personalization, demography and connectivity determine technical progress in medical technology

In the past years, no other target market has stimulated the microtechnology industry as much as medical technology and health care. A constant appearance of new application areas is keeping this market highly dynamic. The trend towards personalized medical, demographic developments and digitalization, but also health policy and cost pressure are driving technological progress in medical technology and health care.

Almost two-thirds of the microtechnology companies in Europe offer products, technologies or services for medical technology and health care; for almost one-fifth these are the most important target markets. The proportion of companies that address the medical technology market with priority will once again rise by five percent over the next three years.

Medical microproducts and technologies are used predominantly in diagnostics and treatment today and in the near future. Applications that address age-appropriate living or the second health market (sports, fitness, and wellness) still have a subordinate, but growing importance. From the perspective of microtechnology companies, the aging society is currently the strongest driver for innovations in medical technology and health care. R&D efforts in micro- and nanotechnology are driven more strongly by the need for personalized methods of diagnostics, treatment and prevention. Digital transformation and cost pressure in the health care sector are also considered to be major driving forces behind innovation in the industry (the digital transformation especially in Germany, the cost pressure more frequently in other European countries).

In which areas of health care are your products or technologies being / going to be applied?

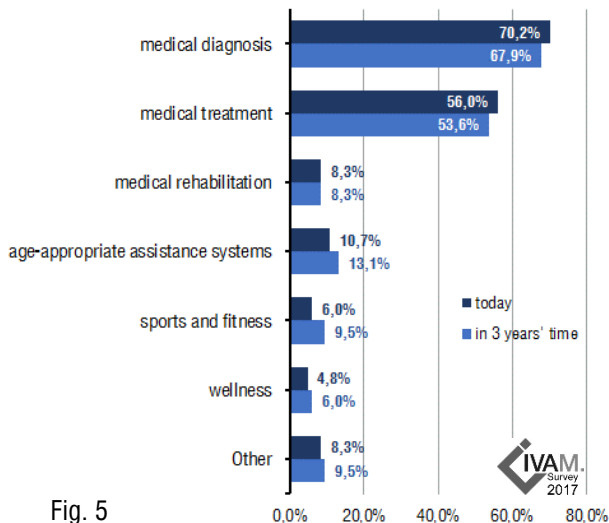


Fig. 5

What do you consider to be major drivers for innovation in medical technology?

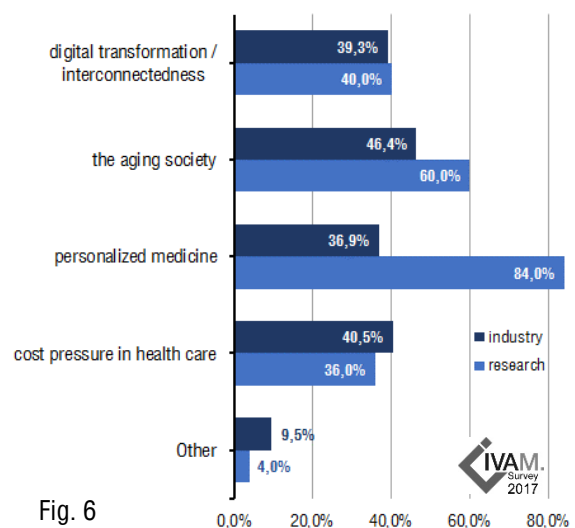


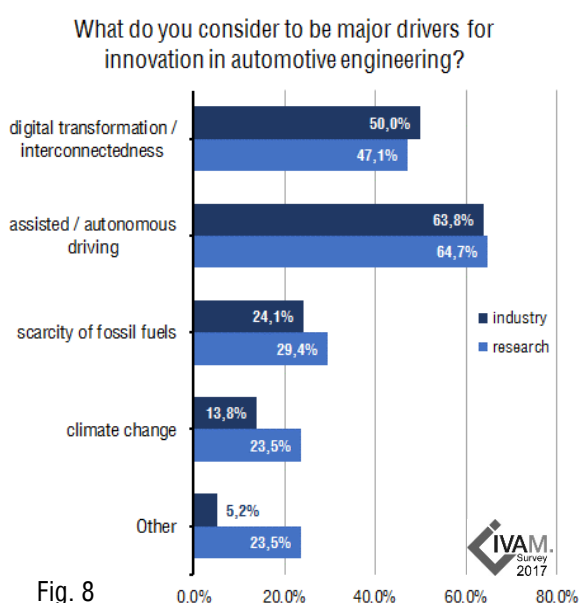
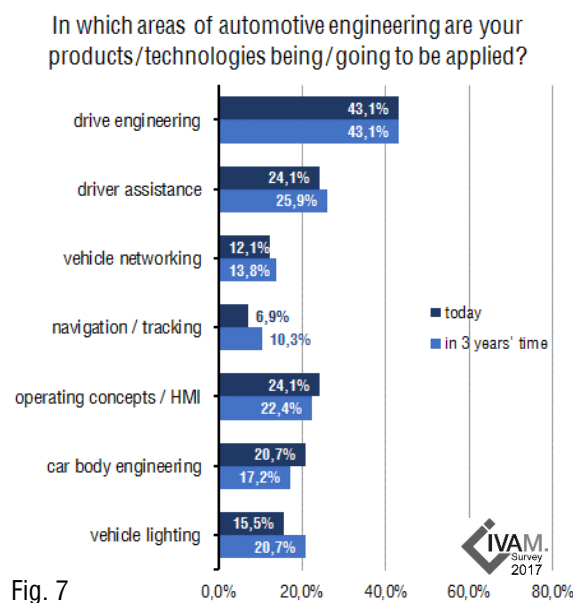
Fig. 6

Assisted and connected driving make the car industry exciting again

After cars seemed to be fully equipped with hundreds of sensors, actuators and electronic components in the 2000s and the market seemed saturated with microtechnology, the need for more efficient drive systems and the trends for assisted and networked driving brought movement back into the automotive industry.

Assisted or autonomous driving and digital transformation are currently the strongest drivers for innovations in automotive engineering. Over the next three years, innovation activity in the supply industry will shift towards digital technologies; applications in vehicle networking, navigation and tracking will increase. More applications will also arise in the area of vehicle lighting.

Drive engineering is currently the leading field of application for microtechnology in automotive engineering, but one that does not undergo any significant changes. Alternative drive concepts such as e-mobility – a major issue in German innovation and environmental policy, a secondary target in EU policy – are not an interesting innovation field for the supply industry, as long as car manufacturers continue to focus on making combustion engines more efficient and environmentally friendly. The reasons that make the development of alternative drives necessary on the part of governments – climate change and scarcity of raw materials – are only seen as secondary drivers for technical innovations in the microtechnology sector.



Disunited Europe and shortage of qualified personnel preoccupy the microtechnology sector

At least as far as the economic situation is concerned, the year 2016 was far less negative than it has been depicted in the media and consequently in public perception. Still, there have been some social, economic and political developments which preoccupy the representatives of the microtechnology industry.

In addition to the nationalist tendencies in the economic policy of the USA [s. section on foreign markets, page 1], the industry representatives also perceive anti-EU tendencies in some member states of the European Union as external uncertainty factors which they cannot influence. More than forty percent of respondents, including a significantly higher proportion (58.5 %) of research and development institutions, regard this as an uncertainty factor for the stability of their organization. The certain exit of the United Kingdom from the EU, an acute symptom of European disunity, is perceived as a possible strain by one-fifth of all respondents and by all British participants. Another frequently mentioned uncertainty factor is the economic imbalance in Europe. The economic weakness of some EU member states worries 44.4 % of company representatives and 19 % of participants employed in research institutions.

The greatest internal challenge is the need to find qualified staff, for both, companies and research institutions. About a third of the industry representatives each are concerned about the competitiveness, innovative capability and profitability of their company. For research institutions, however, financing is the second-largest internal challenge after securing skilled employees.

Significant national differences: Accessing foreign markets is a greater challenge for German companies (31.8 % in Germany versus 12.7 % in other countries). In other countries, companies more often feel challenged by the digital transformation (23.8 % versus 6.8 % in Germany).

What do you perceive as a possible uncertainty factor for the stability of your organisation?

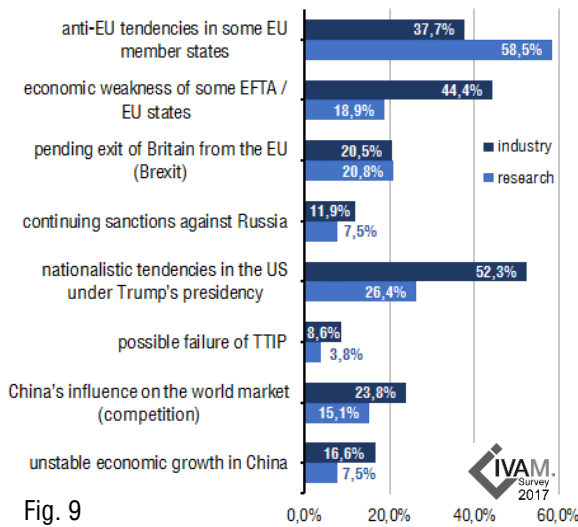


Fig. 9

What do you perceive as a possible internal challenge for the stability of your organisation?

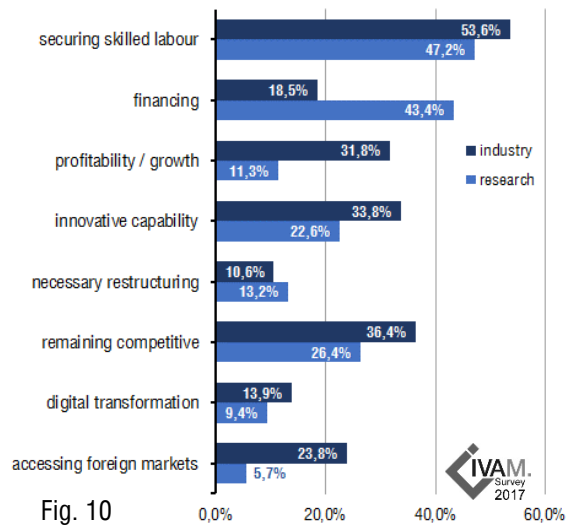


Fig. 10

The digital transformation is no disruption to the microtechnology industry

The advancing digitalization is expected to lead to major changes in industry, economy and society in the years to come. It is perceived as a challenge by many, at least in traditional industries or the service industries sector. The innovative microtechnology industry, which has always played a key role in technological advances, does not think of the digital transformation as a disruption: almost a third of the industry representatives do not regard the digital transformation as a new development, as they have used or implemented new digital technologies in the past already.

The digital transformation ...

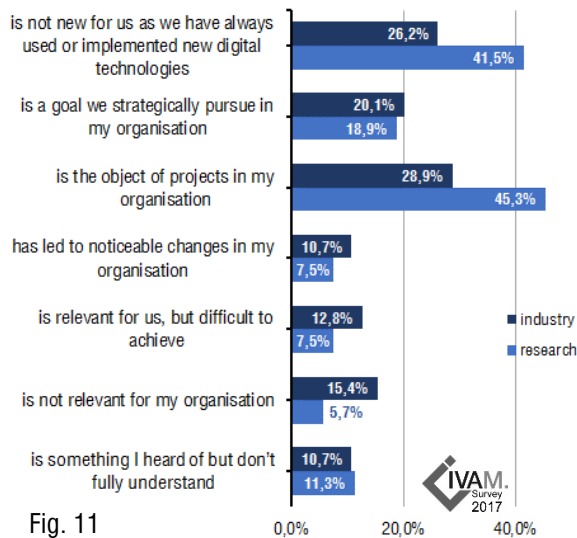


Fig. 11

What are barriers to the implementation of the digital transformation in your organisation?

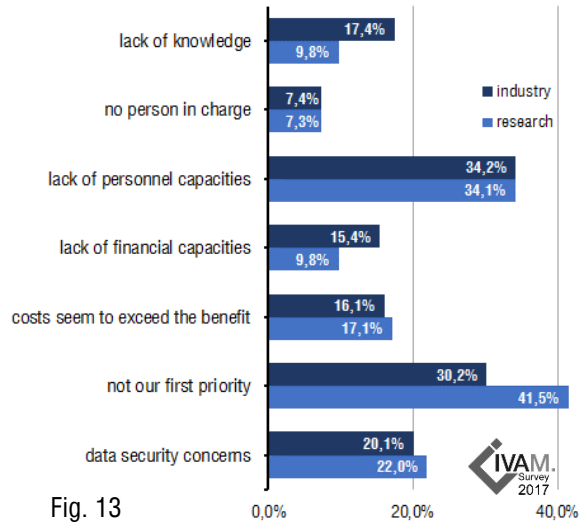


Fig. 13

Digital transformation is nevertheless a topic which the microtechnology industry is approaching not just in theory, but in specific projects and by means of product and process innovation. Two-thirds of the European companies and eighty percent of research institutions are addressing digitalization issues in one way or another.

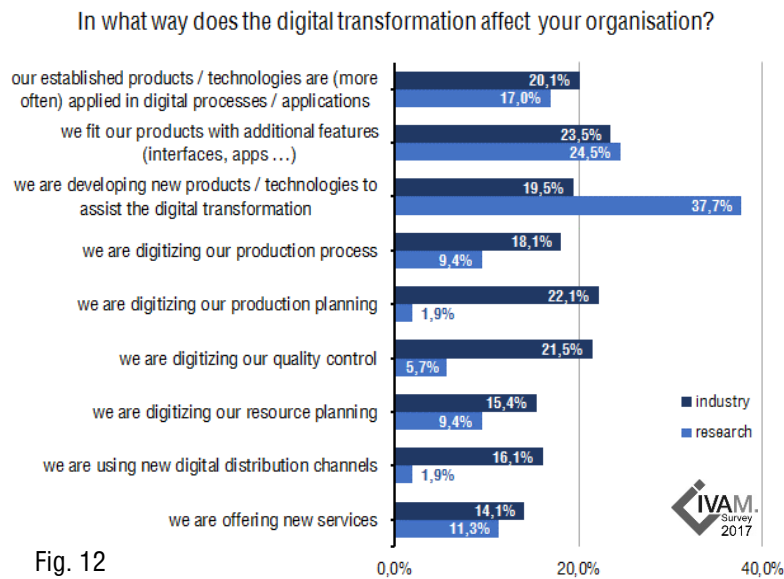


Fig. 12

In particular, the digital transformation has a significant impact on R&D activities in the field of microtechnology: 37.7 % of research institutions are developing new products or technologies that assist the digital transformation. In the microtechnology industry, the digital transformation has so far inspired a little less than a fifth of companies to develop new products or technologies. A slightly higher proportion of enterprises (23.5 %) enhance their established products – for example with interfaces or apps – to make them fit for digital applications. Another fifth of companies did not have to change their existing products or technologies to enable them to be used in digital applications.

Although an average of one fifth of the microtechnology companies digitalize production processes and organizational processes, only a few of them ascribe this to some new trend. In only ten percent of companies, digital transformation has led to noticeable changes. Apparently, digitalization is not perceived as a disruption in this area, either.

Despite their pioneering role in the development and implementation of state-of-the-art technologies, the microtechnology companies should think of addressing digitalization issues more strategically if they want to keep providing marketable products and technologies in the long term. Only a few companies have adjusted their business models in the course of digitalization and are offering new services. Just under a fifth of the companies are giving the topic enough priority to tackle it strategically. One third of the organizations do not have enough manpower to strategically implement digitalization; or personnel capacities are needed for other tasks that are treated with a higher priority. [Figure 13, page 4]

About the IVAM Survey

Once a year, the IVAM Microtechnology Network collects economic data among companies and research organizations that are active in the fields of microtechnology, MEMS, nanotechnology, advanced materials, optical and / or photonics technologies. In January and February 2017, 4,000 companies and research institutes in Europe have been asked about their economic situation and expectations, their major target markets and foreign markets, external and internal challenges, and the digital transformation. The return amounted to 5.1 %. The participants are mostly from countries in Central, Western and Northern Europe – 60 % of participants come from Germany. A large proportion of the participants are representatives of small enterprises: 60 % are SMEs, 5 % start-ups, 10 % major enterprises, 25 % university or research institutes.

Further information:
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