The Transforming R&D Industry

UNDERSTANDING THE TRAJECTORY OF GLOBALIZATION, INDUSTRIALIZATION AND CONSOLIDATION
Engineering and R&D services has grown and evolved significantly in recent years. It is following the same trajectory of globalization, industrialization and consolidation that we saw 10-15 years ago in IT services. Size, therefore, is becoming crucial for leading outsourced R&D players looking to increase their presence with major industrial firms.

In this paper we look at the trends driving this sector, explore how R&D expenditure is evolving, reveal how the market has developed into six distinct categories, and summarize recent acquisition activity.

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As Fig. 1 shows, two further catalysts could accelerate this growth further, pushing the market's size to EUR 240bn: increases in the rate of externalization and outsourcing acceleration could altogether add a further EUR 40-45bn. These would boost market growth to 9% per year over 2017-2022, to be fuelled by four key trends:

1. the avalanche of technology disruptions;
2. growth in High-Tech Industries especially in the US and in Asia;
3. talent scarcity and geographic mismatch between the supply and the demand of engineers;
4. the industrial decision-makers’ deliberate and contrasted approach to engineering and R&D sourcing. The highest annual growth potential, of 9-11%, is expected in Asia, with the US close behind at 8-10%. In Europe, engineering and R&D services are forecast to grow at 4-6% per year, with France, a mature market for this sector, growing at 2-3% annually.

The engineering and R&D services market is forecast to be worth EUR 195-200bn by 2022, growing on average 4.5-5% per year from 2017 based on underlying R&D spending patterns.
Alongside this growth, we see six trends shaping the market:

1. **GLOBALIZATION OF R&D AND ENGINEERING AT MAJOR INDUSTRIAL GROUPS**

   Schneider Electric has five R&D hubs around the world, Qualcomm has its global R&D centre in India, Nissan’s R&D is based in Brazil, and Hyundai’s European Technical Centre is based in Germany. Given that firms like these are adopting this globalized approach, it seems likely that industrial decision-makers will choose R&D partners based on their ability to operate at a global scale.

2. **CONCENTRATION AMONG SERVICE PROVIDERS**

   Major industrial firms are also looking to cut costs and improve efficiency by streamlining the number of suppliers they use. This creates opportunities for larger global service providers, at the expense of smaller firms. Once, the engineering and R&D services industry was fragmented, with low barriers to entry, limited economies of scale, mostly local demand and weak client negotiating power.

   Today, these characteristics are reversed, setting the sector up for further concentration.

3. **A NEW LEVEL OF MATURITY IN THE INDUSTRY**

   Outsourced R&D has changed a great deal in the past 30 years. It began in the 1980s, with engineers charged out on a time-and-materials basis for time spent with the client. During the 2000s, this evolved into teams working on specific projects at client sites. And from 2010 it scaled up to full outsourcing, with R&D groups handling entire product development cycles for their clients.

   Today, a new co-innovation or ‘design thinking’ model is emerging. This sees R&D and engineering service providers working with clients as a partner in their approach to innovation. These providers have a global presence, skills that are transferable across industries, the ability to transform a client’s R&D process and proprietary solutions that can be reused in other projects.

4. **THE EMERGENCE OF A HYBRID MODEL**

   Some projects have led R&D service providers to develop proprietary solutions, from infrastructure and laboratories to their own methods and tools. Combining these solutions with R&D services creates a hybrid model that gives service providers more negotiating leverage while at the same time increasing clients’ agility, efficiency and competitiveness.

5. **GROWING INFLUENCE OF OFFSHORE**

   As Fig. 2 shows, the offshore R&D market could almost double by 2020. The main offshore destinations are India, Eastern Europe, the Iberian Peninsula, North Africa, China, South-East Asia and Mexico.

   According to the technology research and advisory firm ISG (Information Services Group), one-third of R&D and engineering activities are compatible with offshore, in particular design, encoding, prototyping, tests, validation and support, and this percentage could rise to 40-50% in coming years.

6. **EVOLVING CLIENT DEMANDS**

   In the early days of outsourced R&D, clients handled product development and wanted service providers to simply execute for them: “do it for me”. Then, clients looked for more help with development and manufacturing as they lacked all the necessary knowledge internally: “help me do it.” Now, demand has extended upstream of the design phase to: “what should I do?”
Rising expenditure

As digital giants such as GAFA, Tesla and Uber invade their market, major industrial players are looking to step up the pace of their innovation.

Firms once classed as major R&D spenders have been displaced from the top 10 by the scale of the tech companies’ investments. To avoid being left behind, industrials are looking to external partners for help.

The comparison between today and 20 years ago is striking. In the 1990s, only six companies spent more than USD 5bn per year on R&D, four of which were automotive or capital goods: General Motors, Ford, Daimler-Chrysler, Siemens, IBM and Lucent. In 2017, as Fig. 3 shows, over 20 companies invested USD 5bn+ on R&D, with 10 spending over USD 10bn.

Big tech companies account for seven of the top 10 spenders, pushing out all automotive firms apart from Volkswagen, now in third place after two years at #1. Nonetheless, three automakers – Daimler, General Motors and Honda – show steady increases in R&D spend, while expenditure at Volkswagen, Toyota and Ford is steady or slightly reduced.

There are no engineering firms in the top 20 by R&D expenditure.

Overall R&D spend has risen steadily over the last three years, with year-on-year increases of 12% in 2016 and 11% in 2017.

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**FIG. 3: HIGHEST R&D SPENDING COMPANIES (USDbn)**

<table>
<thead>
<tr>
<th>USDbn</th>
<th>Industry</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon</td>
<td>High-tech</td>
<td>12.5</td>
<td>16.1</td>
<td>22.6</td>
</tr>
<tr>
<td>Alphabet (Google)</td>
<td>High-tech</td>
<td>12.3</td>
<td>13.9</td>
<td>16.6</td>
</tr>
<tr>
<td>Volkswagen</td>
<td>Automotive</td>
<td>15.1</td>
<td>15.1</td>
<td>14.7</td>
</tr>
<tr>
<td>Samsung Electronics</td>
<td>High-tech</td>
<td>12.1</td>
<td>12.2</td>
<td>14.5</td>
</tr>
<tr>
<td>Microsoft</td>
<td>High-tech</td>
<td>11.9</td>
<td>12.3</td>
<td>13.9</td>
</tr>
<tr>
<td>Intel</td>
<td>High-tech</td>
<td>12.1</td>
<td>12.7</td>
<td>13.1</td>
</tr>
<tr>
<td>Huawei</td>
<td>High-tech</td>
<td>8.7</td>
<td>10.4</td>
<td>12.5</td>
</tr>
<tr>
<td>Apple</td>
<td>High-tech</td>
<td>8.6</td>
<td>10.5</td>
<td>12.1</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>Life Sciences</td>
<td>9.0</td>
<td>9.1</td>
<td>10.6</td>
</tr>
<tr>
<td>Roche</td>
<td>Life Sciences</td>
<td>9.7</td>
<td>10.1</td>
<td>10.2</td>
</tr>
<tr>
<td>Merck &amp; Co., Inc.</td>
<td>Life Sciences</td>
<td>6.7</td>
<td>10.1</td>
<td>10.0</td>
</tr>
<tr>
<td>Daimler</td>
<td>Automotive</td>
<td>7.3</td>
<td>8.4</td>
<td>9.8</td>
</tr>
<tr>
<td>Toyota Motor</td>
<td>Automotive</td>
<td>8.8</td>
<td>9.6</td>
<td>9.4</td>
</tr>
<tr>
<td>Novartis</td>
<td>Life Sciences</td>
<td>8.7</td>
<td>8.4</td>
<td>8.3</td>
</tr>
<tr>
<td>Facebook</td>
<td>High-tech</td>
<td>4.8</td>
<td>5.9</td>
<td>7.8</td>
</tr>
<tr>
<td>Pfizer</td>
<td>Life Sciences</td>
<td>7.7</td>
<td>7.9</td>
<td>7.7</td>
</tr>
<tr>
<td>General Motors</td>
<td>Automotive</td>
<td>6.0</td>
<td>6.6</td>
<td>7.3</td>
</tr>
<tr>
<td>Ford Motor Company</td>
<td>Automotive</td>
<td>6.7</td>
<td>7.3</td>
<td>7.3</td>
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<tr>
<td>Honda</td>
<td>Automotive</td>
<td>3.8</td>
<td>6.1</td>
<td>6.7</td>
</tr>
<tr>
<td>Oracle</td>
<td>High-tech</td>
<td>5.6</td>
<td>6.0</td>
<td>6.2</td>
</tr>
<tr>
<td><strong>TOP 20</strong></td>
<td><strong>178.1</strong></td>
<td><strong>198.8</strong></td>
<td><strong>221.3</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Companies’ data; Bryan, Garnier & Co

Twenty years ago only six companies spent more than USD 5bn per year on R&D, four of which were automotive or engineering firms. Today, more than 20 companies spent over USD 5bn and 10 spent over USD 10bn.
Evolving market landscape and business models

From local to global.

BEGINNINGS

For more than 30 years, outsourced R&D developed in isolation. Each industrialized country had its own market specific to local labor laws, culture and industrial context. The common feature was that in each case, demand was driven by industrial decision-makers looking for flexibility. Different models emerged. In France, outsourcers first offered time-and-materials services and then structured packages ranging from R&D consulting to industrial engineering. Players such as Altran and Alten primarily covered automotive, aeronautics, energy, telecoms and banking. In Germany, well-established local engineering firms such as Bertrandt, IAV and EDAG continued to dominate, some of them backed by major automakers. However, these firms had little or no international reach. In the US, there was no outsourced R&D market, because outsourcing was still handled by specialized temping agencies or contractors such as Belcan. This is still the case in most US manufacturing.

In the 2000s, following the finance sector’s example, high-tech industries responded to the growth in software by outsourcing some development to Indian IT services companies once their tasks were standardized. This was the beginning of offshore product development services and saw the emergence of specialized players such as Aricent, Cyient, GlobalLogic, QuEST Global and Persistent Systems. At the same time, Indian IT services companies including HCL Technologies, TCS, Wipro, Infosys and KPIT created product engineering divisions.

MID 2000S-PRESENT

The scale of Indian players, by now generating USD 100 million + sales in outsourced product engineering, prompted market study firms to identify it as an industry in its own right. European groups identified the acquisition of Indian offshore specialist as a route into the US market. Alten bought Calsoft Labs in 2011, and Altran followed the purchase of Foliage in 2014 with the acquisitions of SiCon Tech, Lohika, Pricol Technologies, GlobalEdge and Aricent. Offshoring to India from the US primarily focuses on telecoms, software, electronics and semiconductors, with little focus on automotive, aeronautics, energy and health.

DISTINCT CATEGORIES

The competitive landscape has now evolved into six distinct categories of outsourced R&D and engineering companies, all of them adapted to local needs, yet also capable of addressing offshore. In our view, this is similar to the development of IT service providers in the early 2000s, when IBM, Accenture and Capgemini extended and strengthened their offers.
Six categories of R&D and engineering companies

1. FRENCH MULTI-INDUSTRY SPECIALIST

Companies such as Altran, Alten, Akka, Assystem Technologies, SII and Ausy have their origins in labour laws that were too rigid to allow them to fully manage their R&D projects internally. This is because the start-up, ramp-up and deceleration phases of these projects require a certain degree of flexibility.

During the 2000s these players transformed from providing pure technical assistance (e.g. installation of engineers at a client site to work on specific project and billed on a time and materials basis) to work package offers, which meant engineers were supplied under a packaged offer and located nearby rather than at the client site to in order to reduce costs. This service method is now dominant in the French automotive and aeronautic sectors.

2. GERMAN VERTICAL SPECIALIST

Based on the vertical integration of engineering skills, the German model dates back to the 1960s and includes companies such as AVL, Bertrandt, EDAG, IAV and Ferchau. It is focused on the automotive sector and has been extended to the entire product development chain, from conception to production. This spans consulting, design, product engineering and processes, prototyping, modelling, vehicle tests and construction, mechanics, electricity, electronics and software.

There are six categories of competitors in R&D and engineering services. We have observed that it is the French multi-industry specialists are the best placed in the market to maximize the current R&D growth potential as they were the first to become truly international.

3. INDIAN GENERALIST OFFSHORE

Product engineering services at Indian firms such as L&T and Infosys are an extension of their IT services know-how. Their model encompasses entire batches of product development, testing and maintenance. These services are mostly related to customized software and the groups benefit from two advantages: experience in software development and offshore presence with a highly industrialized model. Main clients are telecoms, IT and semiconductor groups, especially in the US. Although a lack of expertise means Indian offshore firms have little presence in other industries, it is nonetheless increasing.

4. AMERICAN-INDIAN SPECIALIST OFFSHORE

Established in the 1990s, players such as Aricent, Cyient, QuEST, Persistent, GlobalLogic were built on activities specializing in software and hardware, telecommunications and other IT services. Bigger Indian companies like L&T and Infosys in the IT services market have also set up R&D and engineering services.

5. GLOBAL IT SPECIALISTS

This category includes Accenture, Capgemini and IBM. Accenture has significant clout in consulting, a recognized brand and an unrivalled network of offshore resources with around 330,000 employees working in its Global Delivery Network. Its outsourcing R&D and engineering activities are located in several business units: Product Engineering & Lifecycle Services (PE&LS), Engineering & Product Operations (E&PO) and Accenture Interactive. Capgemini generates several hundred million euros of sales in outsourced R&D and product engineering via its product and engineering services division, which employs 10,000 engineers including 4,000 at Sogeti High Tech. IBM has a Product Testing & Engineering Design Services business (PTEDS) which covers several entities specialized in design, development, testing and analysis.

6. EASTERN EUROPEAN SOFTWARE ENGINEERING

IT service providers EPAM, Luxoft and SoftServe, established in the 1990s in Belarus, Russia and Ukraine respectively, specialize in software engineering. Luxoft and EPAM are NYSE-listed. EPAM is the biggest software engineering player in Eastern Europe with more than 23,700 engineers, designers and consultants (including 7,500 in Belarus, 4,900 in Ukraine, 3,900 in Russia, 3,100 in central Europe and 1,800 in Asia Pacific). Luxoft is the second-largest, with 13,100 employees including over 11,100 engineers (including 3,500 in Ukraine, 2,050 in Poland, 2,000 in Russia and 1,850 in Romania).
THE INDUSTRY RANKED BY SALES

Fig. 5 lists R&D and engineering services players by 2017 sales in USD. For certain listed players (TCS, Tata Technologies) and non-listed firms (AVL, IAV, Belcan, Ferchau, Aricent, QuEST Global, Ausy, GlobalLogic), we have used estimates based on public-domain information. We have deliberately omitted certain groups, for example Accenture, Capgemini, Tech Mahindra, Mindtree, Cognizant and Luxoft as we do not have precise information on their sales in this field. However, we estimate that Accenture and Capgemini generate around USD 1bn and USD 500 million respectively in these fields.

Acquisition activity

This widening of skills and geographical presence in R&D and engineering services is primarily being achieved through acquisition.

Acquisition activity has been largely dominated by Altran followed by HCL Technologies and Akka.

Fig. 6 illustrates the acquisitions of companies with at least 500 R&D and engineering staff over the last 10 years. Altran’s acquisition of Aricent for EUR1.7bn was the largest.

Private equity funds have also made sizeable deals. Ardian acquired 60% of Assystem’s Global Product Services (GPS) division by for EUR550m in November 2017, and Apax bought GlobalLogic USD 420m in 2014. NB. Apax sold half of its 96% stake in GlobalLogic to CPPIB (Canada Pension Plan Investment Board) in 2017 for an enterprise value of USD 1.5bn, and got rid of the other half to Partners Group in 2018 for an enterprise value of USD 2bn.

IT services providers have made no major acquisitions in the past 10 years. Their outsourced R&D and product engineering businesses have developed as follows:

Accenture

Accenture acquired design studio Fjord, which employs 160 people, in 2013, adding it to Accenture Interactive, its network of design agencies. As of today, Accenture’s global network of 27 design studios employs more than 1,000 staff. Product engineering firm Altitude was acquired in January 2017. At the same time, Accenture built a business associated with Industry 4.0 (e.g. digital manufacturing, IOT), combining consulting, development, integration and operations.

Capgemini

Capgemini inherited an outsourced R&D business with its acquisition of Transiciel in 2003. This business was integrated into Sogeti as Sogeti High Tech and employs more than 4,000 people in 27 locations in Europe, India and Russia. We estimate that Sogeti High Tech has around EUR 300m in sales. In addition, with its acquisition of Igate in 2015, Capgemini inherited a product engineering business primarily based in India, now combined with Sogeti High Tech integrated into Capgemini’s Technology & Engineering Services division (15% of group sales). Over the past two years, the group has deployed Industry 4.0 offers associated with PLM, digital operations and connected objects.

IBM

IBM has made no acquisitions in this field but has developed offers associated with outsourced R&D and product engineering. More recently, these offers have been integrated into the Watson AI programme.
<table>
<thead>
<tr>
<th>Date</th>
<th>Acquirer</th>
<th>Target</th>
<th>Country</th>
<th>Price</th>
<th>Headcount</th>
<th>Sales</th>
<th>Op. margin</th>
<th>Multiples</th>
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</thead>
<tbody>
<tr>
<td>09/2017</td>
<td>Aricent</td>
<td>India</td>
<td>N/A</td>
<td>1 000</td>
<td>EUR21m</td>
<td>20% (2017)</td>
<td>N/A</td>
<td>N/A</td>
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<td>Altran</td>
<td>India</td>
<td>N/A</td>
<td>520</td>
<td>EUR12m</td>
<td>N/A</td>
<td>1x 2016 rev.</td>
<td>N/A</td>
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<td>ARDIAN</td>
<td>France</td>
<td>EUR650m</td>
<td>8 500</td>
<td>EUR578m</td>
<td>8.1% (2016)</td>
<td>2.8x 2017 rev.</td>
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<td>AKKA</td>
<td>Germany</td>
<td>N/A</td>
<td>1 000</td>
<td>EUR119m</td>
<td>7% (2016)</td>
<td>N/A</td>
<td>N/A</td>
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<td>Altran</td>
<td>India</td>
<td>N/A</td>
<td>2 600</td>
<td>INR13000 (USD200m)</td>
<td>11.7% (2015/2016)</td>
<td>1.1x 2016 rev.</td>
<td>9x 2016 EBIT</td>
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<td>03/2017</td>
<td>HCL</td>
<td>India</td>
<td>N/A</td>
<td>700</td>
<td>EUR22m</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>08/2016</td>
<td>Altran</td>
<td>USA</td>
<td>N/A</td>
<td>700</td>
<td>EUR36m</td>
<td>14% (2015)</td>
<td>N/A</td>
<td>N/A</td>
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<td>720</td>
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<td>8% (2015)</td>
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<td>ENGINEERING</td>
<td>India</td>
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<td>526</td>
<td>EUR13m</td>
<td>N/A</td>
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<td>Altran</td>
<td>India</td>
<td>N/A</td>
<td>1 200</td>
<td>EUR180m</td>
<td>N/A</td>
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<td>EUR4m</td>
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<td>Altran</td>
<td>USA</td>
<td>USD128m</td>
<td>500</td>
<td>EUR37m</td>
<td>18% (2013)</td>
<td>2.5x 2013 rev.</td>
<td>14x 2013 EBIT</td>
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<td>Altran</td>
<td>France</td>
<td>EUR7m</td>
<td>650</td>
<td>EUR31m</td>
<td>losses 0.2x 2013 rev.</td>
<td>N/A</td>
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<tr>
<td>01/2014</td>
<td>Apax</td>
<td>GlobalLogic</td>
<td>USA</td>
<td>USD420m</td>
<td>6 600</td>
<td>USD400m (2013)</td>
<td>20% (2013)</td>
<td>1.1x 2013 rev.</td>
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<tr>
<td>02/2013</td>
<td>Altran</td>
<td>Germany</td>
<td>EUR105m</td>
<td>1 800</td>
<td>EUR161m</td>
<td>10% (2012)</td>
<td>0.7x 2012 rev.</td>
<td>7x 2012 EBIT</td>
</tr>
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<td>01/2013</td>
<td>Altran</td>
<td>Germany</td>
<td>EUR50m</td>
<td>650</td>
<td>EUR50m</td>
<td>N/A</td>
<td>1.0x 2012 rev.</td>
<td>N/A</td>
</tr>
<tr>
<td>09/2012</td>
<td>Altran</td>
<td>Germany</td>
<td>EUR120m</td>
<td>2 600</td>
<td>EUR189m</td>
<td>4.8% (2012)</td>
<td>0.6x 2012 rev.</td>
<td>13x 2012 EBIT</td>
</tr>
<tr>
<td>04/2012</td>
<td>Altran</td>
<td>Germany</td>
<td>N/A</td>
<td>3 000</td>
<td>EUR350m</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>09/2011</td>
<td>AKKA</td>
<td>France</td>
<td>N/A</td>
<td>1 235</td>
<td>EUR105m</td>
<td>7% (2016)</td>
<td>N/A</td>
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<tr>
<td>09/2011</td>
<td>GlobalLogic</td>
<td>USA</td>
<td>N/A</td>
<td>1 000</td>
<td>EUR15m</td>
<td>N/A</td>
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</tr>
<tr>
<td>04/2011</td>
<td>Altran</td>
<td>USA</td>
<td>EUR15m</td>
<td>600</td>
<td>USD22m</td>
<td>9% (2010)</td>
<td>0.9x 2010 rev.</td>
<td>6x 2010 EBIT</td>
</tr>
<tr>
<td>12/2008</td>
<td>Altran</td>
<td>Sweden</td>
<td>EUR18m</td>
<td>550</td>
<td>EUR81m</td>
<td>8.4% (2007)</td>
<td>0.4x 2008 rev.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Conclusion**

For outsourced engineering and R&D services, size is becoming crucial. Globalization, a maturing industry, the importance of offshore, and more complex client demands are all creating an environment where scale matters. While today we see several distinct categories of service provider – including the major IT services firms – all of them having growing scale and reach in common, typically achieved through acquisition.
About Bryan, Garnier & Co

Bryan, Garnier & Co is a European, full-service growth-focused independent investment banking partnership founded in 1996. The firm provides equity research, sales and trading, private and public capital raising as well as M&A services to growth companies and their investors. It focuses on key growth sectors of the economy including Technology, Healthcare, Consumer and Business Services. Bryan, Garnier & Co is a fully registered broker dealer authorized and regulated by the FCA in Europe and the FINRA in the U.S. Bryan, Garnier & Co is headquartered in London, with additional offices in Paris, Munich, Zurich and New York. The firm is a member of the London Stock Exchange and Euronext.

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