



Developments within the components industry are of course of crucial importance for the PCB industry, but they also have implications for the future of the Electronics industry as a whole. In order to get a picture of how developments in the components industry is progressing, we turned to Anders Pettersson, Technical Marketing Manager at ST Microelectronics, a global leader in the semiconductor market.

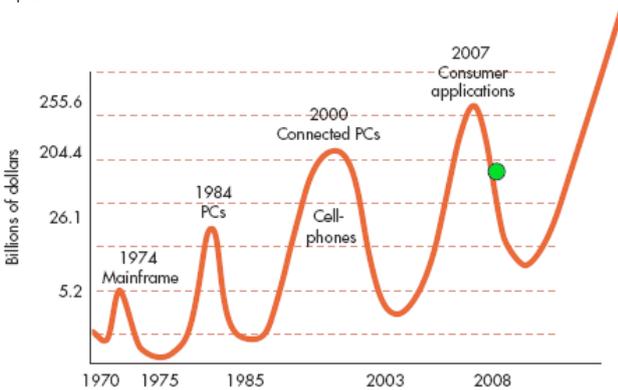
**How would you describe developments within the components industry over the past 20 years?**

"If we look at the situation historically, the industry went through a long period of extreme highs and lows caused by fluctuating supply and demand conditions. Different, individual trendsetting applications such as TVs, DVDs and mobile phones had an incredible impact for periods of time. Rocketing demand created bottlenecks, which led to a surplus of stocks at the end of that cycle, which in turn led to a remarkable price situation."

"The fluctuations during the past 10 years haven't been quite so marked since there is now a really wide variety of applications that influence the market. There are today, applications such as smart phones and tablets; but alongside them we find fantastic things happening within electronic measuring devices, gaming consoles, and the automotive and other heavy industry sectors. There are thousands of industrial applications that also function as driving factors. These different sectors don't have the same cycles, which evens out the peaks and troughs. One could sum it all up by saying that the industry has matured."

**What factors steer and drive the development of new electronics products?**

"Today increasingly, it's the mass market that's the main driver. Generally, it's the customers who steer the development of new products. We can try to influence what our customers want - and as producers, we obviously also wish to work with emerging technologies. However, I'd go so far as to say that 90% of our behaviour is steered by customer feedback. In order to position ourselves appropriately on the market, we are constantly having to look at what products or functionality we need to develop within a 3-4 year time span."



From a historical perspective, the electronics industry has to a large degree been driven by a small number of individual applications, which led to major fluctuations in demand.

"Sometimes customers think they can't influence things, but their feedback is a vital contributing factor for our development. It is the customers' needs that prompt us to develop new components or functions combined with working to achieve cost savings and ultimately, lower prices to the end user. Since both involve a considerable amount of investment, we don't take any chances and want to make absolutely sure that we can meet our customers demands."

**Where is the trend taking us today?**

"With microcontrollers, there are two main directives : low-cost and

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**ANDERS PETTERSSON,  
TECHNICAL MARKETING MANAGER,  
ST MICROELECTRONICS**



high-performance, critical when considering the transition from the 8-bit market to a 32-bit market. This shift has happened incredibly fast. In the low end segment, volume is the driver."

"In the high-end segment, we're approaching clock rates of 200 MHz. It is becoming increasingly difficult to differentiate between the microcontroller market and the market for microprocessors. Many microprocessor customers are going to start looking at microcontrollers as possible alternatives. They are, among other things, considerably less power hungry."

**What does the future have in store for components?**

"On the digital side, the drive will continue to be along the path of miniaturisation. This will lead to more integration, with more and more functionality incorporated on the silicone. We are always looking to see how much more we can integrate so as to cut the customers' total costs as much as possible. Clock generators, peripherals and analogue to digital converters are already built in and my question is, what is the next item that is common enough to be incorporated into the silicone in the next-generation of microcontrollers?"

**What are the implications of miniaturisation?**

"As more and more items are being integrated into the chip, the challenge of internal wire bonding, which cannot be easily miniaturised becomes a factor. The microscopic geometries applied in production will lead to higher initial costs for the chip, although the silicon itself will be cheaper. The implications here are that we'll become more dependent on larger volumes."

"For the customer, this may require a change of attitude towards components. The smaller the size of the silicon, the lower its marginal cost and as a result, packaging processes and logistics will become all the more relevant in the final total cost."

**Do you see any risks with the way the technology is developing?**

"As far as our customers are concerned, we encourage them to work with us to develop solutions that serve best, their market aspirations, their end customer expectations and also, consider the challenges we face. The culture of simply selecting on price alone becomes a risk when considering total costs and the brand damage that can occur if for example, unreliable components and products are launched into the market place."

"The solution is to use recognized component manufacturers whose routines include solving any possible quality issues before they cause any serious damage. When you build in more and more functionality, it is vital you also focus on building in reliability at the design stage. At ST we recycle as many peripheries and building

blocks as possible into our new designs. We also build more and more redundancy into the silicon. To reduce our initial costs, we strive to produce new designs that work as well as possible right from the start.”

**How would you describe your collaboration with the rest of the manufacturing chain?**

”We are working a great deal with our end customer as well as major EMS companies, given that they are likely to be the companies who purchase the components for production. With regard to PCB supplies, we need to work on issues relating to miniaturisation and packaging. It makes sense that we establish a good platform for collaboration along the entire chain. Our end customers in particular would benefit greatly by getting everyone involved and not putting all the responsibility on the EMS companies. That would for example improve their delivery precision to their own customers.”

**What challenges is the PCB Industry having to face due to developments on the technology front?**

”On the consumer side, we’re seeing a focus on smaller packaging types, which will require more layers in the boards. The challenge here will thus be the high level of integration, to maintain stocks of PCBs for very small package types, while remaining profitable.”

”If a customer is looking for low energy use at a low-cost, choosing the right PCB is crucial. Interestingly, we are seeing antennas for different radio applications being increasingly incorporated into new designs. This definitely offers the PCB industry an opportunity to contribute value through its competence.”

**What about the assembly industry?**

”As far as the assembly industry is concerned, reliability is the biggest challenge. The EMS companies have to be able to deliver quality even with small packaging types.”

**ST MICROELECTRONICS IN BRIEF**

- One of the biggest semiconductor manufacturers in the world who supply components to many different segments of the electronics industry.
- Originally founded as a French-Italian company.
- Corporate headquarters in Geneva Switzerland.
- Listed on the New York Stock Exchange, Euronext in Paris, as well as Borsa Italiana in Milan.
- Turnover 2012: US\$8.49 billion.
- About 48,000 employees in 35 countries, 11,500 of which engaged in R&D.
- Manufacturing facilities in 12 locations in Europe and Asia.

**Questions around the world: What demands is the PCB industry facing as a result of the rapid technology advancements?**



**USA**  
**KATHY NARGI-TOTH**  
Technical Director,  
NCAB Group USA

”These rapid developments have created a demand for innovation and investment. To achieve success, companies need to be proactive, and make investments that improve both people skills and advance technology, with new equipment and techniques. To become a leading PCB provider, they’ll have to focus on continuous improvement activities that enhance manufacturing flexibility and responsiveness. Being involved at the design phase is one of the best ways to meet the customers’ requirements.”



**FRANCE**  
**CHRIS NUTTALL**  
Group Quality/Technical Manager,  
NCAB Group France

”The industry faces a constant challenge with new learning curves as part of a constantly changing electronics landscape. We have seen this with miniaturization and we will see this again with 3D printed circuit structures. Design guidelines and quality standards have to evolve as technology develops. Materials, processes and factories will need to keep pace for long-term survival. Knowledge is power– so the faster we ‘learn’, the better the outcome.”



**SWEDEN**  
**RIKARD WALLIN**  
Managing Director,  
NCAB Group Sweden

”We need to, among other things, handle basic and advanced technology in parallel with our customers. To maintain flexibility, it’s vital PCB producers have full control of all their processes. Both the producer and buyer need to have the skills and knowledge to recognize the core factors in each individual project. Among the tougher challenges we are facing is the need to establish a good dialogue with both our direct customers and end customers, so as to avoid any misunderstandings during the business process.”

## Knowledge and training make all the difference

What impact is the rapid technical evolution within electronics having on the PCB industry and how should customers and suppliers handle the changing scenarios. We put this and other related questions to Bo Andersson, Technical Manager at NCAB Group.

### How would you describe developments within the PCB industry during the past 20 years?

"If we go back 20 years, surface mount technology was a new and challenging technique. Since then, developments have been driven by the increasingly small transistors. Today you can fit in more and more functionality on the same surface area. This has enabled increasingly complex boards to be designed - incorporating, for example micro vias, more layers, copper-filled micro via holes and HDI technology."

"We're also seeing far stricter demands being placed on designs that also have to adhere to recommendations. Customers are also demanding better reliability, in fact, having to troubleshoot or repair electronic products is looked upon as a thing of the past today. Everything in the industry moves much faster, with automation having come so far that any faults that do occur tend to be system-related. The PCB industry has developed strongly during this period, from small manufacturing units who tried to "do everything", to larger players with their own specialities. That's why it's important to make sure that a factory is able to fulfil its designated task."

### What effects are the rapid technological developments having on the PCB industry?

"Compared to components, for example, PCBs differ in so far as they are produced for specific customers and applications, in smaller quantities and under conditions that are difficult to control. The more complex they become, as a result for example of miniaturisation, increasing layer count or working with leadless components, the more demanding the manufacturing process will become. There are risks attached. The challenge will always be to improve the manufacturing process. By further automating the process and introducing so-called clean room facilities to create a dust and dirt free environment, you can reduce the risks and be appropriately equipped to handle miniaturisation."

"As I said, the faults that occur are often systemic, which makes it crucial to be able to control the factories you assign the work to. You need to put a lot of time and effort into finding manufacturing partners whose processes are proven and robust. The advances in technology make it increasingly important to choose the right manufacturer who can offer production that can be adapted for different applications. And we should also remember that large scale production is a specialised activity today."

### What do PCB suppliers need to do to keep pace with developments?

"It is above all a matter of training and building up your skills and knowledge. We need to interact very closely with our manufacturing



Bo Andersson, Technical Manager, NCAB Group

partners and monitor their progress. That, as well as follow up and help them to build up their skills, knowledge, processes and equipment. I also think it's important to collaborate with the assembly industry. There are synergy advantages to be gained here with regard to design and assembly blueprints for example. As PCB suppliers, we need to learn from, as well as build up an understanding for, our customers."

### In what ways can the PCB industry develop its links with the assembly and components industry.

"The price of the PCBs can be set at an early stage of the design and development process. The PCB and assembly industries have a great deal to gain by making use of appropriate design skills and thereby produce boards that are optimised for manufacturing. PCB manufacturers can help EMS companies to make substantial savings by helping them to choose the right designs. Choosing appropriate components is also part of this process."

"With regard to the components industry, generally, it is a large-scale and highly consolidated sector and produces components for all kinds of applications. PCB suppliers can't influence developments that much, but it is important they stay abreast of them. Both industries should be aware of each other's limitations. It is difficult to forecast the future, but we'll probably see different types of hybrids appearing, such as components built into the PCBs."

### And what is the best approach for customers to adopt in this scenario?

"Here again, it's basically a matter of building up your skills and knowledge and collaborating closely with your suppliers. Awareness and training is what makes the difference and can give you a better total cost."



# The world and PCBs are becoming smaller

HANS STÄHL  
CEO NCAB GROUP



The trend across the entire electronics industry is miniaturisation. This puts considerable demands on all parts of the supply chain. The major part of the cost of the finished electronic application tends to be components and PCBs. Technologically, the components are the drivers of miniaturisation. As PCB manufacturers, we are having to adapt to this development - a challenge that involves major investments in equipment and new factories.

From a historical perspective, the different links within the supply chain have not, as a rule, collaborated. However, as Anders Pettersson so aptly points out, there is growing awareness of the need to do this. Today we find ourselves interacting to a much greater degree

both with the component manufacturers, EMS companies and end customers. This is an extremely positive trend, which has led to equally positive results; our "Seamless Production" product is a direct result of that dialogue.

No one today can afford to remain behind closed doors concocting their own solutions. It is vital for all the suppliers involved to tailor a package for their end customers, which takes into account factors such as the level of technology required, volumes, just-in-time, costs, cash flow, etc. Optimised end products like these can only be achieved through broad collaboration involving a number of different niche manufacturers.



Read more about the components industry.

- » [ST Microelectronics](#)
- » [International Distribution of Electronics Association](#)

## Subjects we have covered earlier

Do read our earlier newsletters. You will find them all on our website, [www.ncabgroup.com/newsroom/](http://www.ncabgroup.com/newsroom/)

» **High product mix**

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» **The American market**

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» **Reforms**

2012 06 25 | NEWSLETTER 2 2012

## Are we taking up the wrong subjects?

We are always looking for interesting subjects that we could take a more in depth look at.

If there is something you would like to learn more about, or perhaps you would like to comment on anything we have written, do get in touch with us and tell us more.

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