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The Global Semiconductor Industry Analysts

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Presents

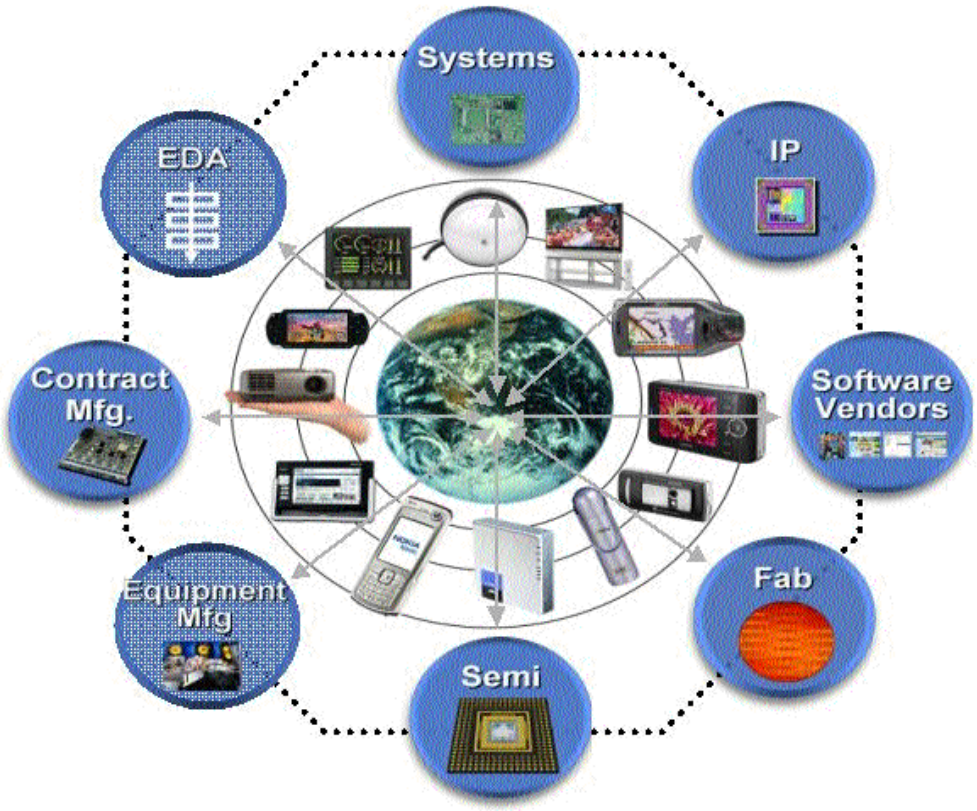
Under The Auspices Of
CzechInvest - Investment &
Business Authority

Post Forum Summary

International System & SoC 2007

5th Annual International System & SoC Forum

System Level Design
The EndTo-End Imperative



Crown Plaza Hotel,
Prague, Czech Republic
Oct 10-12, 2007

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Delegates feedback and Forum Photographs

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“This event is the most cost-effective and efficient way of staying in touch with industry trends; it is now a permanent part of my annual ‘must do’ calendar.”

“I have never before managed to talk with so many international executives in such a time-efficient and productive way.”

“As a start-up CEO, the Forum gave me the opportunity to raise my firm’s profile; I’ll be back next year, this time with my CTO as well.”

“I’ve always wanted to meet several of the key industry executives attending this Forum; your Forum has finally given me this opportunity.”

“The main reasons I attend your Forums are for the networking & profile raising; yours are the only conferences I now bother to attend – keep up the good work”

“The open seating arrangements gave me ample opportunity to speak to the people I needed to.”

Forum Programme

Thursday Oct 11, 2007

09:00-09:10 **Introduction & Welcome - Crowne Plaza "Congress Hall"**
Malcolm Penn, Chairman & CEO, *Future Horizons*

09:10-09:20 **Welcome Address**
Martin íman, Minister Of Industry & Trade, *Government Of The Czech Republic*

09:20-09:30 **"CzechInvest – Partner For Your Business In The Czech Republic"**
Alexandra Rudyšarová, Director – Investment & Applied Research Division, *CzechInvest*

Session 1 "Driving The SoC Applications Revolution"

09:30-10:00 **"Now to 2010; A Personal Perspective"**
Scott McGregor, President & CEO, *Broadcom Corporation*

10:00-10:30 **"Product Platforms Drive R&D Efficiency & Time-to-Market"**
John Heugle, President & CEO, *austriamicrosystems*

10:30-11:15 **Coffee Break - Networking/Informal Discussions**

Session 2 "Enabling The SoC Systems Revolution"

11:15-11:45 **"Optimizing Silicon Through Collaboration"**
Kevin Meyer, Vice President, *Chartered Semiconductor*

11:45-12:15 **"System Integration At The Package Level – A Mainstream Solution"**
Jean-Francois Lanson, Senior VP GM Europe, *Amkor Technology*

12:15-12:45 **"Consumers Go Digital But The Real World Is Still Analog"**
John O'Brien, CEO, *Silicon & Software Systems Ltd (S3)*

12:45-14:00 **Forum Lunch**

Session 3 "Market Forecasts"

14:00-14:30 **"Worldwide Semiconductor Market Outlook"**
Malcolm Penn, Chairman & CEO *Future Horizons*

14:30-14:45 **"Fabless & Chipless IC Design Market Overview"**
Chris Ryan, Industry Analyst *Future Horizons*

14:45-15:15 **"Challenges & Opportunities For The SoC & System Industry"**
Mike Bryant, Chief Technology Officer *Future Horizons*

15:15-16:00 **Coffee Break - Networking/Informal Discussions**

Session 4 "Fabless Industry Executive Panel"

16:00-17:15 **"Managing The SoC/System Finance Challenge"**
Chair - Martin Gibson, Partner *Atlas Venture*
David Hamilton, Founder & CEO *ATEEDA*
Stan Boland, President & CEO, ICERA
James Foster, CEO *XMOS Semiconductor*

17:15-17:30 **"ChipInvest – A New Czech Fabless Semiconductor Start Up"**
Tomáš Bohrn, Chairman Of The Board *ChipInvest*

20:00-23:00 **Forum Fiesta (coaches depart hotel front lobby at 19:30)**

Friday Oct 12, 2007

08:30-08:45 **Opening Remarks - Malcolm Penn Chairman & CEO, *Future Horizons***

Session 5 "Riding The SoC/Systems Revolution"

08:45-09:15 **"The Last 25 Metres - Silicon Value Opportunities"**
John Scarisbrick, CEO *Cambridge Silicon Radio*

09:15-09:45 **"Do It Yourself Is Dead"**
Jack Harding, President & CEO *e-Silicon*

09:45-10:15 **"Designing Systems In The 21st Century"**
Rudy Lauwereins, VP Nomadic Embedded Systems, *IMEC*

10:15-10:45 **"The Greening of SoCs: How Engineers Will save The World"**
Rich Goldman, VP Strategic Market Development, *Synopsys*

10:45-11:30 **Coffee Break - Networking/Informal Discussions**

Session 6 "Grande Finale Executive Panel"

11:30-12:40 "Bringing SoC Systems To Market"
Chair - Malcolm Penn, Chairman & CEO, *Future Horizons*
Massimo Vanzi, CEO, Accent
Mattias Voigt, General Manager Engineering Group, *NEC Electronics*

12:40-12:55 **Closing Address**
Vladimir Haasz, Vice-Chairman Of The R&D Council Of The Czech Republic

12:55-13:00 **Forum Wrap Up**

13:00-14:30 **Grand Finale Lunch**

Keynote Presentation Summaries

(in programme presentation order)

"Now to 2010; A Personal Perspective" – Scott McGregor, President & CEO, Broadcom Corporation

Scott McGregor explained that Broadcom's growth is by acquisition as well as organic growth, however, Broadcom is very choosy with takeover targets. Broadcom is mainly successful - 50% create shareholder value, 25% neutral and 25% fail to give gains. The very small acquisition team chooses one or two small companies per quarter, with the aim to add IP or IQ in a market that Broadcom is already in or aim to be in. Broadcom chooses small companies to ease speed of integration. Bigger acquisitions take longer and are more painful to both sides. As an example Scott gave the European Philips (now NXP) and the American VLSI as a difficult merger of cultures. Electronic innovation is changing. Years ago the product design was done by the OEM. Now the IC company does much more - the architecture and the detail design and much of the software. Half of Broadcom's engineering hires are now in software. As an example look at the Bluetooth solution in which Broadcom supplies protocols, software, hardware and development boards to secure design wins and now much of the product differentiation is in software. Broadcom got into Nokia with a 'Bluetooth plus FM' solution and showed Nokia how fast a fabless company can work. It is not true that IDMs can give better products or prices. Fabless companies are faster, more flexible and because they outsource to several foundries they end up with a better and well-characterised product. Nokia is now one of Broadcom's 'teaching' customers alongside Apple and Google as they 'stretch' Broadcom. When answering questions about IP protection Scott sees Chinese laws and attitudes changing the more China develop its own products. With a consumer product lifetime of only 9-12 months Scott sees this as protection in itself. The big issue is in cell phones - If everyone with IP in a phone wants a percent royalty per handset, regardless of whether you make the handset out of plastic or out of platinum, then the present IP model is unsustainable. Broadcom is fighting hard in the US courts against a San Diego company's licensing strategy. He points out that Ericsson, Nokia and TI are fighting for a level playing field for wireless chips in Europe.

"Product Platforms Drive R&D Efficiency & Time-To-Market" - John Heugle, President & CEO, austriamicrosystems

John Heugle explained that austriamicrosystems build low-power integrated analogue SoCs primarily for the automotive and industrial sensor market. An example is magnetic rotary encoders that are progressively replacing opto-encoders. Also going well are power and light management products for handheld electronics. Half of the company's US$250 revenue was in the form of standard products, a quarter in ASICs and the remainder from an analogue foundry. The move from a foundry and ASIC background to a standard product supplier was made by building flexible and programmable SoC IC platforms. The company would announce a 'lead' product and use the product's flexibility to interconnect the company's analogue and digital IP to create a series of derivative products across a series of new markets according to customer demand. This reuse of IP from the company's own characterised cell database has meant an more efficient R&D and a significant increase in the number of products released. Although austriamicrosystems is primarily an analogue house it has a relationship with TSMC, which allows it to incorporate digital circuits and is working with licensees IBM and Infineon to increase its position in the high-voltage market.

"Optimizing Silicon Through Collaboration" - Kevin Meyer, VP, Chartered Semicondictor

Kevin Meyer explained that there had been a number of disruptive changes in our industry. Examples of this are the problems of dealing with the complexity of hundreds of millions of transistors, the high mask cost and the short consumer product life cycles. Add to this the high volumes of product to make any return and the high cost of failure, or even partial failure in missing time targets and it is difficult to see how a single company can succeed alone. To work alone a company needs to develop process architecture and achieve acceptable reliability and yields. It will have to have its own IC design infrastructure and EDA tools, its own system architecture and software and hardware design teams. This is all an enormous investment and so most companies concentrate on system architecture, software, marketing and

Keynote Presentation Summaries

customer management. This leaves design and manufacturing which is progressively being outsourced to companies that will develop and invest in these disciplines. In the '90nm and beyond' world the circuit designer needs to be process aware and the process designer design aware. To meet this need, a joint development alliance has been set up between Chartered, IBM, Infineon, Freescale, Samsung and ST and a common process/design platform has also added ARM, Analog Bits, Ponte, Blaze, Mentor Graphics, Amkor, Virage Logic, Synopsys, Chipidea, Magma, Clear Shape and Cadence. This gives the foundry customer a firm roadmap in the future going towards 32nm. Due to power issues, scaling is dead and the business is now material science and this skilled engineering is brought about by this type of collaboration

"System Integration At The Packaging Level - A Mainstream Solution" -
Jean Francois Lanson, Senior VP GM Europe, Amkor Technology

Jean-Francois (Jon) Lanson discussed how the package has become a bigger part of the SoC solution and, in the way Moore's Law has predicted the ability of silicon, packaging has kept in pace with this silicon evolution. Out-Sourced Assembly & Test (OSAT) is a main source of assembly and test moving from 41 percent in 2005 to 50 percent by 2010. Silicon in Package (SiP) is solving many of today's SoC requirements. Look at the mobile phone - the mixed technologies and specialised components in the RF section are combined using SiP. Baseband chips are being consolidated using 3-D, wafer level and flipChip packaging and this will continue further as new mobile phone applications, such as GPS, FM radio and mobile TV, are added to the present phone and the present constrained-size format. This will be resolved using Chip Scale Packages (CSP), which will allow more silicon per cubic mm. Other technologies, such as in package RF screening, will encourage transceivers and baseband in the same package, thus reducing the radio component count and the radio footprint. As the same mobile phone will soon utilise GSM, 3G, Bluetooth, Wi-Fi, NFC and WiMAX it becomes much more complex and sub modules need to be assembled within the same-shielded package. All these sub modules need to be tested before assembly bringing more skills and added value to the OSAT companies. These developments - that can reduce system size by 75 percent - cannot be designed in a vacuum and therefore need close collaboration by all, including the need for EDA companies to seize this opportunity.

"Consumers go Digital But The Real World Is Still Analogue" -
John O'Brien, CEO, Silicon & Software Systems Ltd (S3)

To deliver the next generation of products and services to the consumer **John O'Brien** explained that the designer has to consider connectivity and mobility. Connected consumer technologies are the driving growth in semiconductors and while this is seen as a digital phenomenon significant challenges remain at the interface between the digital and real analogue domains. With the integration of Google and the Internet into mobile phones and multifunctional products, such as the iPod and iPhone, products need higher bandwidth and need to operate all over the world. However, the network edges are still analogue - physical connectivity is analogue, to and from the network is analogue and the user interface is analogue. Device media capture, rendering of images, speech, audio and video are all analogue. But SoC devices are mostly CMOS and digital so there is a need for analogue interfaces with sensors, ADCs and DACs. With the zero marginal cost of gates, digital CMOS is imagined as 'free'. The main differentiation of SoCs is how the analogue section is handled. This involves trade-offs between integration, performance, power consumption and of course price. Consumer SoCs in 65nm CMOS need analogue IP that is device proven to achieve this product excellence and time-to-market.

"ChipInvest - A New Czech Fabless Semiconductor Start Up" -
Tomáš Bohrn, Chairman Of The Board, ChipInvest

Tomáš Bohrn explained that ChipInvest, is a partnership between CzechInvest and electronic/semiconductor industry companies, such as Cadence and Microsoft. One of its objectives is to make it easier for companies to take advantage of the region's workforce of analogue/mixed-signal designers by taking the risk out of creating a design group in the Czech Republic. The goal of ChipInvest is to direct this potential towards systems that create important social values such as electronics for non-evasive diagnostics and telemedicine. One example shows Czech built equipment involving smart sensors for ambulant and home diagnostics feeding patient information back via DSL to a

Keynote Presentation Summaries

central management system. Tomas says that the Brno-based ChipInvest works in two ways. As an outsourcing house, it accepts design work from multinational or fabless companies. It also helps grow start-ups by cooperating with Czech incubators, evaluating new projects, providing support, and helping to secure funding. It has at present a portfolio of 10-15 projects in the pipeline totalling 50 million euro.

"The Last 25 Metres – Silicon Value Opportunities" -

John Scarisbrick,
CEO, Cambridge Silicon Radio

John Scarisbrick discussed how using DSL, cable, 3G and other modem technologies substantially solves the 'last mile' of the Internet challenge and these solutions have slowed in innovation velocity so competition now increasingly focuses on low price and margin. This is not so for the 'end of the wires' sector and Bluetooth is set to become the de facto wireless technology for the last 25 metres of the Internet. Despite a growing interest in Wi-Fi and VoIP, Bluetooth technology has a long way to run with new versions such as Ultra Low Power (ULP) - formerly known as Wibree - and Ultra Wideband (UWB) - the possibilities are enormous. The last 25metres is inside homes and offices. This opportunity is about connecting a broadband Internet connection to a multiplicity of devices for audio, video and control. An example is the Bluetooth headset allowing hands-free connection to a mobile phone, or an Internet Radio – classically styled as a consumer friendly tabletop appliance – tuning into an unlimited number of streaming audio sources. It could include Bluetooth equipped TVs; sensibly muting when an incoming mobile phone call is detected, or long lasting VoIP phones using the low cost tariffs of the next generation of phone service providers. These will be demanding markets to create, needing the highest quality radios, with ultra-long battery life, extensive software and systems support and delivered on low cost platforms. CSR has achieved value in growth markets by using integrated analogue/Digital SoC solutions with smaller footprints than the competition and integrating and delivering everything including communication protocols and software.

"Do It Yourslf Is Dead" -

Jack Harding,
President & CEO, e-Silicon

Jack Harding explained how the start-up company is the hunter-gatherer of today - continuously on the lookout for food - but today food reads cash. The cash of today comes from the VCs until the company becomes self-funding. It is difficult for a company to get into this self-funding mode without the help of others - so alliances and partnerships are formed. The new fabless company is likely to use IP from ARM, use design tools from Cadence and Mentor, outsource its assembly to Amkor, use Teradyne tests and uses a foundry such as TSMC. It can then leverage the investment these companies have made. A new company needs to spend resources on what differentiates it and this is likely to be product definition, architectural design, field applications and marketing. What it finds is that the organisation and support of the chain of other activities is time and resource consuming. What is found is that a company like eSilicon can manage the network of services that can bring the product to market allowing the fabless company to spent more time exploiting its core competencies. Relationships are time consuming and so these 'value-chain producers' can use existing long-term relationships and expertise to give the right skills when needed, can use its leverage to obtain good prices and reduce the complexity of running a new semiconductor company. Running a global value chain is hard and expensive and 'Do-It-Yourself is Dead' if you wish to succeed.

"Designing Systems In The 21st Century" -

Rudy Lauwereins, VP Nomadic Embedded Systems, IMEC

The continued scaling according to Moore's Law has brought us to a point where a few complete processor cores can be reliably implemented on a 2-Dementional chip **Rudy Lauwereins** explained. Scaling however, has its fundamental limits. In the future in the 22nm mode the dopants become visible in the 30x30x30 atom gate, where the oxide is only 2 or 3 atoms thick. This atomic-level of uncertainty will cause unreliability as some transistors, and if they work, are only likely to last only a year. These circuits will therefore have inherent unreliability and we have to plan how to get around this. Using a weighted Monte-Carlo statistical methods we can model this. Transistors will be free so we can put monitors in the circuitry and switch in and out circuits when required. We can trade off delay for power and if circuits drift with temperature or aging the system can be redesigned in situ using nearby stable

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circuitry. Variability increases exponentially per node and unreliability follows suit. To overcome the need to scale and to utilise the efficiency of dedicated logic, memory and analogue processes then 3-D techniques can be used. Rudy says that an experimental software defined radio has proven the economics and performance of the 3-D methods. The number of processing engines per circuit was 23 in 2006 and will be 32 in 2007 and will be over 100 by 2012. IMEC sees multiprocessor systems on a chip and multiprocessor chips stacked with each other and memory and other logic joined by a flexible interconnect. One of the biggest challenges is the programming and the communications between the hardware and software engineers plus the need for EDA support to follow suit in a seamless path.

SYNOPSYS®

"The Greening Of SoCs: How Engineers Will Save The World" -
RIch Goldman, VP Strategic Market Development, Synopsys

Rich Goldman illustrated how the expanding world was a complex system. He illustrated the growth in terms of population, life expectancy, and energy use and showed how this use drove massive increases in carbon emissions. The global proliferation of electronics brought huge benefits to the developing economies, but this growth of electronics was also a major contributor to global warming. It was now the responsibilities of engineers to solve the climate change problem by becoming more conscious of power consumption issues. By putting power saving circuitry on all equipment engineers can save hundreds of power plants around the world. Mobile phone engineers have concentrated on power consumption techniques to maintain battery life, but it has been of lower importance in the design of mains-connected equipment such as PCs and TVs. In the design of SoCs with each reduction of feature size transistor leakage problems increase, effecting yields, functionality and performance. This can be reduced using 'design for low power' techniques and a number of circuits are now in production proving the design software. There is now a chance for engineers to make their mark not only through low-power SoC designs, but more use of intelligent control in domestic appliances, in intelligent standby modes in video and audio equipment, and in intelligent motor and building services control. Finally, Rich mentions a 'Lower Power Methodology Manual' written by ARM and Synopsys.

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> "Not only did I learn a lot from the presentations, the networking was excellent and the enjoyment factor high. It was also the least stressful and most productive event I have attended."

Semiconductor Monthly Update Report

http://www.futurehorizons.com/page/18/global-semi

A CEO favourite, this report is all a busy executive needs to keep in touch with industry trends. E-mailed monthly, the report provides a useful industry momentum indicator by compiling 12-monthly rolling charts for Units, Average Selling Prices (ASP) and Revenues broken down by total SC, IC, Optoelectronics and Discretes. Also included is a review of the world economy, broken out by region, plus a monthly feature on a key semiconductor market driver. The link between the economy and the semiconductor industry is not perfect but by measuring and understanding the impact of wafer fab capacity on lead-times and prices, and by monitoring the level of system OEM, distribution and semiconductor company inventory, more sense can be made of this fundamentally unstable industry. The report focus is on in-depth analysis and the underlying industry trends.

Annual Semiconductor Report

http://www.futurehorizons.com/page/15/annual-semi

This two-volume report provides market analyses and forecasts of the worldwide and European semiconductor market (Volume 1), as well as a detailed analysis of the 27 key semiconductor end-user applications and industry market drivers, collectively accounting for three quarters of the total IC market (Volume 2). This value-added bundle is a must-have for anyone interested in the global semiconductor market and European detail.

Semiconductor Application Markets Report

(Previously called the Key Market Drivers Report)

http://www.futurehorizons.com/page/16/semi-app-market

Volume 2 of the Annual Semiconductor report is available separately as the Semiconductor Application Markets Report. Individual chapters describe how each application works, the technology used, the unit sales history and forecast, the semiconductor content and the associated semiconductor market size. This vital research resource volume is a proven industry favourite. Individual applications are also available as separate reports; please call for details.

European Fabless Semiconductor Report

(Previously called the European Chipless & Fabless IC Design House Report)

http://www.futurehorizons.com/page/17/euro-fables

This 300-page report covers the European and Israeli, chipless, fabless and independent IC design house community, and is essential for those planning the resources of subcontracting new product design, both in the semiconductor industry and the final system end product. It will also prove invaluable for authorities and government departments, planning and directing economic growth, as well as companies seeking investments, potential partners or acquisitions. As an added user benefit, the 280 strong chipless and fabless IC design house company database is available in Excel format as an optional CD extra (not available separately), with both pre-organised sorts (by country, design skill and application) and in raw data format allowing customised searches and analyses. This best-selling report has a proven track record as an invaluable research resource.

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2007/2008 Diary Dates

Jul 24, 2007	**IFS2007-MT, Mid-Term Semiconductor Industry Briefing, London** Mid-year analysis & forecast of the European & WW semiconductor market
Sep 03, 2007	**Silicon Chip Industry Training Seminar, London** Presented in layman's term, this seminar provides a complete overview of the integrated circuit industry, its background, technology, manufacture & markets
Oct 10-12, 2007	**International System & SoC Forum 2007, Prague, Czech Republic** IFF2007 - 5th Annual International System & SoC Forum. An international forum to discuss business issues within the international design & IP market, meet new contacts, share experiences, explore ideas and refine strategic thinking
Nov 26, 2007	**Silicon Chip Industry Training Seminar, London** Presented in layman's term, this seminar provides a complete overview of the integrated circuit industry, its background, technology, manufacture & markets
Jan 29, 2008	**IFS2008, Semiconductor Industry Briefing, London** Annual analysis & forecast of the European & WW semiconductor market
Mar 17, 2008	**Silicon Chip Industry Training Seminar, London** Presented in layman's terms, this seminar provides a complete overview of the integrated circuit industry, its background, technology, manufacture & markets
May 7-9, 2008	**International Electronics 2008 Forum, Dubai, UAE** IEF2008 - 17th Annual International Electronics Industry Forum. An international forum to update market forecasts, develop new business opportunities, meet new contacts, share experiences, explore ideas, and refine strategic thinking
Jun 09, 2008	**Silicon Chip Industry Training Seminar, London** Presented in layman's terms, this seminar provides a complete overview of the integrated circuit industry, its background, technology, manufacture & markets

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Established in April 1989, Future Horizons provides market research and business support services for use in opportunity analysis, business planning and new market development. Its industry information seminars and forums are widely considered to be the best of their kind. Emphasis is placed on the world-wide semiconductor and electronics industry and associated markets. Emphasis is placed on the worldwide microelectronics and electronics industry, and European market environment.

5th Decade Of Semiconductor Experience

Malcolm Penn is the founder and CEO of Future Horizons, with over 45 years experience in the electronics and semiconductor industry. He has worked extensively throughout Europe as well as in the United States, the former USSR, Japan and Korea, and was an early pioneer of pan-European research and product development collaboration in the 1970s during his tenure with ITT Europe. His industrial experience has involved him with all aspects of the management, manufacturing, marketing and use of electronic components, particularly semiconductor devices.

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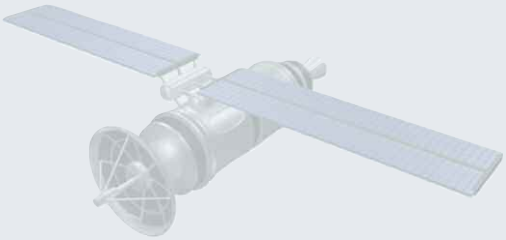

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