“Without passionate entrepreneurship, genius inventions are likely to languish and never achieve their full potential.”

Kenneth Morse: Speaking from the heart

“The woodstove reduces pollution from smoke to a tenth, and organic volatile emissions to one-hundredth of the level of traditional, three-stone cooking fires.”

Satisfying a burning need

“We are at the beginning of a new era in medical care.”

Medical technology – Saving lives, reducing costs

Philips Lumalive fabrics – creating a magic lighting experience with textiles
Cover story
Philips Lumalive fabrics

Few activities in life are more rewarding than self-expression. From choosing the clothes we wear to the way we decorate our homes, each of us has an opportunity to create something intensely personal and very special. Textiles have always played an important part in this creativity, providing us with a rich tapestry of color, texture, shape and form. Thanks to on-going work at Philips Research, animated color illumination is a new creative dimension that textiles will now be able to deliver. Philips Research’s new light-emitting ‘Lumalive’ textiles will also have important applications in healthcare and personal safety.

Further in this issue
4 Technology news
12 Another perspective
16 What’s new 1
17 Joint contribution
22 What’s new 2

6 Philips Lumalive fabrics
Creating a magic lighting experience with textiles

Features
23 Healthcare
Medical technology – Saving lives, reducing costs
28 Technology
The wood stove - Satisfying a burning need

Password is a quarterly magazine published by Philips Research.
Philips Research, part of Royal Philips Electronics, has laboratories in three regions (Europe, East Asia and North America) where around 1,800 people investigate promising options for innovation.

Editor-in-chief
Peter van den Hurk
E-mail: peter.van.den.hurk@philips.com

Production management
Claudia van Roozomlen
Erica Schrijvers

Distribution management
Cees Jan Mol
Erica Schrijvers

Editorial Board
Prof Dr Emile Aarts, the Netherlands
Dr Steve Batterby, United Kingdom
Prof Wouter, the Netherlands
Dr Falko Bunse, Germany
Elan de Vries, the Netherlands
Dr Michael Panholz, USA

Design and Art Direction
Sturm Scott, Eindhoven

Printer & Lithography
Roto Smets Grafik Services
Eindhoven

Other contributors to this issue
William Third
Cees Jan Mol

More information and subscription
Philips Research Public Relations Dept.
Prof Holstebaan 4
5616 AA, Eindhoven, the Netherlands
Tel: +31-40-27 29403
Fax: +31-40-27 44947
E-mail: pr@philipsresearch.com
See also http://www.philipsresearch.com

© Koninklijke Philips Electronics N.V. 2006
All rights reserved
Articles may be reproduced in whole or in part provided that the source "Philips Research Password" is mentioned in full, photographs and illustrations for this purpose are available via the above-mentioned website. The editor would appreciate a complimentary copy.

In this issue

Creative entrepreneurship in a dynamic environment
After having been an integral part of Philips for 53 years, Philips Semiconductors is now a separate entity called NXP – a true Next Experience. This disentanglement was an inevitable, essential step to get Semiconductors in a better position to extend its field of play and opt for strong growth.

The disentanglement has also had a major impact on Research. On October 1st, 360 former employees of Philips Research commenced their employment in the new corporate research organization of NXP. And although this means a significant loss with regard to intellectual resources, the cooperation and synergy between Research and the new research organization of NXP will for a large part be prolonged, albeit in a more formal way. In terms of location, little will change: the new NXP research organization will remain accommodated at the High Tech Campus Eindhoven, the Netherlands, and at IMEC Leuven, Belgium. They will continue to make use of the many facilities and services – clean rooms, IT environment - which they have been utilizing over the years. And from within Research, about 65 people will still be working for NXP on a large number of projects and many will collaborate in the fields of System-in-Package (SIP), low-power design and signal processing.

Open Innovation – the future of Philips Research
About three years ago, Philips Research management decided to take the Open Innovation route: with our focus on Healthcare and Lifestyle, we are constantly on the lookout for new types of relationships with strong partners in innovation, in the academic, clinical, industrial and business world. For example, in August, we reached an agreement with BG Medicine on a development partnership in patient-centered diagnostics and personalized medicine. And in October, we opened our Life Sciences Facilities at the High-Tech Campus Eindhoven, which house multi-disciplinary research for molecular diagnostics, imaging and therapy. These facilities will be used in cooperation with universities, university hospitals and research institutes, offering a unique blend of scientific, medical and industrial partnerships in this field.

"Research is becoming an ecosystem that nurtures organic growth to drive Philips forward."

Increasingly, Research is becoming an ecosystem that nurtures organic growth to drive Philips forward. New, breakaway technologies will lead to new business opportunities in new markets. Lumalive fabrics – innovative light-emitting textile technology that can display text, graphics or animations in full-color - are a clear example of this. Furthermore, we are stimulating entrepreneurship with an increasing number of lab ventures and incubators – commercial channels in which we allow our technology to become the basis of new business ventures – taking more risks to bring innovations to the market faster. We are also on the lookout for emerging markets that require specific solutions, carefully targeted at the needs of consumers. The wood stove, for example, shows that we should be able to improve the lives of many families in the world’s poorest regions by taking a revolutionary, new approach to ‘ancient’ technology. And with our labs in Europe, North America and Asia, we are ideally positioned to expand our innovation ecosystems on a global scale and leverage our regional positions.

Rick Harwig
CEO Philips Research
CTO Royal Philips Electronics

Editorial
Technology news

Book on Ad Hoc and Sensor Networks


This book introduces a new explanatory cross-layer model specifically designed to understand all aspects of ad hoc and sensor networking, from design through performance issues to application requirements. Future directions, challenges and potential simulation projects are also discussed.


Game developers and publishers sign up to amBX revolution

In the past months, Kuju, a first-class game developer company, and THQ Inc., a leading game publisher, joined the burgeoning list of game developers, publishers and peripherals manufacturers supporting amBX-enabled games, including Revolution, Sumo Digital, Philips Peripherals & Accessories and SpectroVideo.

Created by Philips, amBX technology revolutionizes the game play experience by extending the gaming world out of the screen and into the real world. Featuring a scripting language, software engine and architecture, the amBX format delivers all-new player experiences through amBX-enabled devices such as LED color-controlled lights, active furniture, rumbleers, fans and heaters, all placed strategically around a player’s room.

In September, THQ Inc. published their eagerly-awaited PC game Broken Sword: The Angel of Death, the fourth release in the award-winning adventure series from Revolution Software and Sumo. With amBX, gamers will undergo a full ‘sensory surround experience’ when playing this innovative, adventurous game.

Kuju plans to have its RAIL SIMULATOR published by Electronic Arts Europe in early 2007, which will allow both rail enthusiasts and casual users the opportunity to drive steam, diesel and electric trains on real routes throughout the UK and Germany. By amBX-enabling the game, all the familiar sights, sounds and feelings of the railway experience will be recreated around the player, including wind, track rumble and lighting - both in and out of the tunnels.

Philips Research East Asia amongst best 25 R&D centers in China

Philips Research East Asia has been ranked as one of the ‘25 Best R&D Centers’ in China by Global Entrepreneur, a key Chinese business publication. In 2005, Philips filed the most patents of all R&D centers based in China and was also ranked as the third largest foreign investor with over US$3 billion investment in China and US$1 million investment in R&D.

The ranking was based on 5 criteria: investment, infrastructure, management, capability and collaboration. This ranking shares Philips amongst international giants such as Microsoft, IBM, Motorola, Sun, Siemens, Nokia, HP and Unilever. A total of 150 international companies and 20 Chinese enterprises participated in this ranking.

Frans Grieuwen, Managing Director of Philips Research East Asia: “We are extremely proud that we have been chosen as one of the 25 best R&D Centers in the very competitive environment China offers. It is a big compliment to our scientists. But much is still to be done. It is a strong stimulus to become even better than we are today.”

New joint Electronic Measurement Laboratory at High Tech Campus Eindhoven

On September 12th, Philips announced a collaboration between the MiPlaza shared research facility, Agilent Technologies and Cascade Microtech, to establish a world-class Electronic Measurement Laboratory at MiPlaza on the High Tech Campus Eindhoven.

The laboratory will enable development of the increasingly complex and high-speed chips which are at the heart of next-generation wireless systems. Such innovations include wireless communication in the home providing the infrastructure for ambient intelligence, high-frequency RF imaging systems in hospitals, and ultra low power wireless sensors for use in and around the human body.

These wireless innovations will demand massively increased data transfer rates, 100-1000 times higher than currently available. This means increased bandwidth and consequently higher frequencies. The new laboratory supports these requirements, enabling measurements to be performed at very high frequency in the RF range.

Using amBX technology multiple peripherals in the room around you work in harmony with the game to deliver a new sensory experience: surround lightning, sound, vibration, air flow and other effects.

In September, THQ Inc. published their eagerly-awaited PC game Broken Sword: The Angel of Death, the fourth release in the award-winning adventure series from Revolution Software and Sumo. With amBX, gamers will undergo a full ‘sensory surround experience’ when playing this innovative, adventurous game.

Kuju plans to have its RAIL SIMULATOR published by Electronic Arts Europe in early 2007, which will allow both rail enthusiasts and casual users the opportunity to drive steam, diesel and electric trains on real routes throughout the UK and Germany. By amBX-enabling the game, all the familiar sights, sounds and feelings of the railway experience will be recreated around the player, including wind, track rumble and lighting - both in and out of the tunnels.

On September 12th, Philips announced a collaboration between the MiPlaza shared research facility, Agilent Technologies and Cascade Microtech, to establish a world-class Electronic Measurement Laboratory at MiPlaza on the High Tech Campus Eindhoven.

The laboratory will enable development of the increasingly complex and high-speed chips which are at the heart of next-generation wireless systems. Such innovations include wireless communication in the home providing the infrastructure for ambient intelligence, high-frequency RF imaging systems in hospitals, and ultra low power wireless sensors for use in and around the human body.

These wireless innovations will demand massively increased data transfer rates, 100-1000 times higher than currently available. This means increased bandwidth and consequently higher frequencies. The new laboratory supports these requirements, enabling measurements to be performed at very high frequency in the RF range.

Using amBX technology multiple peripherals in the room around you work in harmony with the game to deliver a new sensory experience: surround lightning, sound, vibration, air flow and other effects.
Creating a magic lighting experience with textiles

Few activities in life are more rewarding than self-expression. From choosing the clothes we wear to the way we decorate our homes, each of us has an opportunity to create something intensely personal and very special. Textiles have always played an important part in this creativity, providing us with a rich tapestry of color, texture, shape and form. Thanks to on-going work at Philips Research, animated color illumination is a new creative dimension that textiles will now be able to deliver. Philips Research’s new light-emitting ‘Lumalive’ fabrics will also have important applications in healthcare and personal safety.

By Peter Harold

Photography/illustrations: Philips, Capital Photos, James Peru

It is a well-known fact that by controlling the intensity of red, green and blue light-emitting diodes (LEDs) placed in close proximity to one another, you can re-create just about any color imaginable. The principle is already widely exploited in the LED-based advertising screens that surround virtually every premiere football stadium.

By sealing conventional low-cost LEDs into a laminated plastic panel that is flexible and durable enough to withstand constant flexing, the Photonic Textiles group at Philips Research has succeeded in embedding arrays of these LEDs beneath the surface of textiles, making it possible for soft furniture and clothing to come alive with myriad patterns of colored light. Layers of translucent textiles cover the LED panel to diffuse the light so that the pixels flow smoothly into each other and also provide the required level of softness and surface texture. Integrated electronics drives the LEDs to create fixed or moving patterns of light that bring the magic of illumination to the textiles.

“Sounds simple in theory, but in practice it isn’t,” says team leader Bas Zaper. “In developing solutions for our Lumalive fabrics, we faced significant technological challenges in creating large-area electronic systems that on the one hand are mechanically very flexible, yet on the other hand are also very robust. In addition, we have put a lot of effort into improving the modularity of the LED array, minimizing the number of interconnections and miniaturizing the control electronics.”

But how do you turn an innovative and illuminating idea into a commercial success? “It’s not enough to just explain to people in words and still pictures what they can do with our Lumalive fabrics”, says Zaper. “Our technology allows for an impressive dynamic and colorful visual experience, and therefore we prefer to give practical demonstrations to potential partners and customers. Triggered by the magic lighting experiences, they normally come up with large numbers of application ideas. And if they then really show commercial interest in the technology, we offer them sample kits for test purposes within their own field of use.”

These experience exercises are now being performed by several leading furniture, sportswear and rucksack manufacturers as well as by some of Europe’s best known interior designers. Furthermore, Zaper and his team are taking live demonstrations to leading...
consumer electronics shows such as the IFA in Berlin (Germany). These demonstrations currently include a stylish over-jacket with a Lumalive panel built into the front or the back and a living-room sofa that emits colorful patterns of light along the length of its backrest. “The sofa is particularly impressive, because when they first see it most people look up to the ceiling to see where the projection beam is,” says Zeper. “Then they suddenly realize the light is actually coming out of the sofa itself.”

“**We faced significant technological challenges in creating large-area electronic systems that on the one hand are mechanically very flexible, yet on the other hand are also very robust.**”

Bas Zeper, Photonic Textiles team leader

Having succeeded in capturing their interest, Zeper and his team then provide potential customers with a development kit so that they can get a feel for the technology and how it might fit into their products. Comprising a square panel containing an array of two hundred RGB pixels, plus all the necessary drive electronics, design manuals and a selection of suitable diffuser and overlay materials, this kit allows designers to experiment with a wide range of different lighting effects.

Lumalive fabrics may be set to revolutionize the clothes we wear and the way we furnish our homes, but consumer-oriented markets are not the only ones on Zeper’s hit list. As the examples on the following pages illustrate, light-emitting textiles also have important potential applications in medicine, healthcare and personal safety.

Among the Lumalive demonstrations produced by Philips Research are a stylish over-jacket with a light-emitting textile panel, a living-room sofa with a light-emitting textile backrest, and a pillow that displays soothing color patterns.

Philips Lumalive couch is a perfect example of how Lumalive light-emitting fabrics can be used in the home, or professional environments like lobbies and offices.

Philips Lumalive fabrics
In the future, window curtains and blinds won’t just be used to block out the light. They will be able to replace a drab and overcast day with the soothing patterns of clouds drifting across a sunlit sky, the dappled light of a woodland walk or your very own display of the aurora borealis. And it won’t be limited to curtains. Just about anything made of material in your home will eventually become a potential source of mood lighting.

In personal safety
When it comes to safety after dark, ‘see and be seen’ is the order of the day. Light-emitting Lumalive fabrics used in outdoor sportswear could make sure you see night-time joggers long before you catch them in the beams of your car headlights. Built into the protective clothing of first responders, such as police, fire and ambulance crews, they will insure instant visibility from the moment responders arrive on scene.

In culture
Lumalive fabrics will give tomorrow’s youngsters the ability to instantly customize their clothing with the names of their favorite pop idols or sports stars, and bring a whole new dimension to text and multi-media messaging. And it’s not only off-stage that these textiles will have an impact. They will also add a new creative dimension to the performing arts.

In fashion
Tomorrow’s supermodels could be strutting the catwalks in clothes that dazzle the audience like never before, with colors and patterns changing instantly to suit different moods. And because you’ll be able to program your own colors and patterns onto your clothes, the scope for personal expression will be virtually limitless.

In signage and advertising
With Lumalive fabrics, virtually any soft-furnishing or fabric surface can be used to display information or logos. Place your glass of beer on the table in front of you and sensors in the table could automatically detect the brand and communicate it to the chair you are sitting on. Hey presto, your chair reflects your taste in beer.

In interior design
...
Kenneth Morse: Speaking from the heart

Although Ken Morse heads-up MIT’s Entrepreneurship Center, he’s far from an academic management guru. Morse has certainly earned the right to be different. He ‘walked his talk’ by launching five successful high-tech companies during an entrepreneurial career spanning 25 years prior to his arrival at MIT in 1996. If your preference is for a calm, relaxed working environment free from commercial pressure, look away now.

By Steven Keeping
Illustration: Storm Scott

“I believe that entrepreneurship is the rare, but necessary ingredient needed to coax technology from comfortable laboratories with plush carpets on a tortuous path to the cruel crucible of the global market place,” says Morse. “Without passionate entrepreneurship, genius inventions are likely to languish and never achieve their full potential. People who say they don’t want commercial pressure aren’t going to be worth anything to an entrepreneur anyway and would be better off in academia. That said, all the decent researchers I know are not interested in having their inventions languishing in an ivory tower; they want them to see the light of day to make a difference to the world.”

Get out there and sell!
According to Morse, the most important factor in ensuring a product’s success isn’t how innovative it is, it’s not down to a slick marketing campaign, nor the brand, or even the price – it’s the sales team. Being technically talented is not enough: you’ve got to be brilliant at focusing on what your customers really want and deliver it fast. “Think of the many examples where a company with inferior technology but a better sales force soundly defeated the company with the best technology,” he explains. “Sales are more important than technology almost every time.”

And that is a very important lesson for Europeans. “European start-up teams may be at a disadvantage when it comes to having the necessary passion for perfection and swift, seamless sales execution,” explains Morse. “Unfortunately, there is definitely less of a recognition of the importance of sales relative to technology in Europe than in North America.”

“Today’s bright young European entrepreneurs were typically not raised to think about the importance of the ‘dirty business’ of sales [unlike many of their North American peers]. They did not grow up running lemonade stands, going door-to-door selling girl-scout cookies, or having to fight to win a scholarship or place at their selected college by ‘selling’ themselves to the governing body.”

Morse advises that there is no better way to find out what’s going on in a market place than to go out and try to sell to a customer. For that matter, he adds there is no better way to get approval for funding of an innovative product than to go get a customer. “I have seen so-called managers debating the potential viability of a new project until the cows come home,” he says. “The best way to break the impasse is to go find a customer and bring in a purchase order.”

According to Axel Schmiegolow, CEO of Denkwerk Neue Medien Holding GmbH and Vice President German Multimedia Association, this skill is critical. He says: “The ability to quantify the customer’s need, and to hit the key points with very few terms and sentences, is the most important competence for anyone and everyone who is responsible for marketing and the acquisition of customers. From our start-up stage, this important competence enabled us to become more profitable in the long run and to grow continuously.”

And if you want to raise funding, you’d better make sure you can sell. “The number one thing investors look for in a management team is whether they have done it before,” notes Morse, “but the number one thing investors look for in a business plan is who will be the first ten customers.”

“Without passionate entrepreneurship, genius inventions are likely to languish and never achieve their full potential.”

Featherbeds hurt
This lack of sales experience is compounded by Europe’s habit of featherbedding academic institutions. Morse believes university funding is too generous. “I have never heard of a European Professor having to make an ‘elevator pitch’ for his or her lab or get on an airplane to ‘pass the tin cup.’ Selling their capabilities in order to raise funds would probably sharpen up their game and give them something useful to pass on to students.”
Ken Morse: A man with a mission

Ken Morse is a serial entrepreneur, having played a key role in launching several high-tech start-ups, including ICare Corporation, Aspin Technology, an expert systems company, and a biotech firm. Ken’s batting average is 0.83: five of his start-ups went public or were successfully merged; one was a complete disaster. Now, as head of the MIT Entrepreneurship Center (mission statement: to develop and nurture leaders who will make high-tech ventures successful), Morse is responsible for inspiring, training, and coaching new generations of entrepreneurs from all parts of MIT. Ken has been profiled and quoted in numerous publications, including the Wall Street Journal, Financial Times, The Economist, and Red Herring.

Since Morse joined the MIT Entrepreneurship Center in 1996, the number of students taking Entrepreneurship Courses has increased from 220 to 1,500 per year while the number of professors and lecturers has grown from two to thirty. He has been an instructor in sales at the Planetch Academy for several years and has taught a global sales strategies workshop in several European cities, including Delft.

In September Morse co-presented an Entrepreneurship and Innovation course at the High-Tech Campus in Eindhoven with Henry Chesbrough from the UC Berkeley Haas School of Business. The course is designed to give delegates an insight into what it takes to succeed in today’s cutthroat high-technology market.

Morse, an American, is a member of the Council on Foreign Relations, the Cercle Royal Gaulois Artistique & Littéraire (Brussels), and the Quai des Yachts Club. He speaks fluent French and some Chinese. When he is not helping young companies to succeed, Ken enjoys sailing his wooden boat with his family around Cape Cod.

Surviving the ‘cruel crucible’

Nonetheless, the challenge of building new businesses, either inside large corporations or start-ups, is getting tougher and more perilous with shortening time-to-market cycles, more complex products, increasing customer expectations and sharper competitors. Many new products that might have succeeded 5 years ago, will sink without trace today. However, Morse says failure shouldn’t discourage an entrepreneur, it should simply be treated as a learning experience, a rite of passage: “In Silicon Valley, honest bankruptcy is like a duel scar gained in a Prussian officer’s mess. People who do not fail from time-to-time are not pushing the envelopes,” says Morse, “and groups who gravitate towards the lowest common denominator are working inadvertently to assure the early death of their organization.”

The pressure is on

Large high-tech companies don’t really have a choice but to adopt entrepreneurial principles or die. Philips has successfully adapted in the past and its move towards an entrepreneurial and innovative culture is just the latest step in a long evolution. While some large high-tech companies are still likened to dinosaurs, Philips has seen the meteorite coming and is changing before it strikes. But the pressure is still there.

“The problem of innovation must be taken seriously,” explains Morse. “It used to be that the Chinese and the Indians only wanted to eat our lunch, now they want our jobs and they fully understand that low-cost manufacturing is only the first step. They are now focused on stimulating innovation as a matter of national policy.”

To compete, European companies need to learn quickly that a large conglomerate is far from the ideal environment to foster entrepreneurship. Speaking at the annual MIT Venture Capital Conference in 2002, keynote speaker Professor Robert Langer of successful biotech start-up Langer Labs was speaking about why large firms were poor at commercializing university intellectual property (IP). He said: “It never works well with big companies. They focus their energy on showing why the new technology won’t work. I always prefer to start a new company [with the] focus, energy and commitment [to make the technology work].”

What’s needed for a large firm is to create the small company environment, with passionate individuals taking a stake in that company’s success. The Philips Incubators are dedicated to doing just this by nurturing and developing innovative new technologies in the early part of their commercial lifecycle.

Philips Research established 3 incubators and allied with US/UK venture capitalists New Venture Partners (NVP). The Philips Lifestyle incubator is already home to Entertable, which is due to launch its Game Center commercially in 2007. Liquavista, a high-tech fledging spin-out, reflective display company, based on Philips Research technology, was brought up under the wings of NVP developing rapidly into a sizeable venture.

“I have seen so-called managers debating the potential viability of a new project until the cows come home.”

Johan Feenstra, Liquavista’s Technology Platform Director has risked much by taking a stake in the business “You need to be brave and willing to embark on a relatively unknown professional journey,” he explains. “And while high-tech start-ups may be fairly normal on the US East or West coasts, it has to be said that they are a bit unusual in Holland.”

Another perspective
Philips makes healthy eating just a click away

Although most people recognize that healthy eating is part of a healthy lifestyle, they sometimes need a little help in choosing the right things to eat. If employees regularly enjoy their meals in a company restaurant or canteen, help is now on hand: The Personal Nutrition Coach, a new web-based, healthy-eating system developed by Philips Research, provides users with key insights into health aspects of their food intake and motivates them to adopt optimal eating patterns.

Electronic purchasing with a company smart-card is common practice in many company restaurants and canteens. The Philips system not only takes care of the billing but also authorizes uploading of the purchase details to the Personal Nutrition Coach server: each meal is assessed for its nutritional value, including its calories, fat, carbohydrate, protein and fiber content. The results are displayed on a user-specific password-protected web page.

Philips Research’s Personal Nutrition Coach not only acts as a nutrition monitor: It also acts as an interactive trainer, recommending eating and exercise strategies that help users to meet their objectives. It also includes educational web pages, diet-related questionnaires and useful food recipes.

Philips has already started a three-month trial of its Personal Nutrition Coach in three restaurants on the High Tech Campus in Eindhoven, the Netherlands.

Video Fingerprinting for automatic video identification

Following the success of Philips Audio Fingerprinting, the Philips Content Identification group announced Video Fingerprinting at IFA 2006 in Berlin, Germany. This technology enables content owners, and content service providers such as operators and internet service providers, to automatically identify video segments and hence ownership of material by comparing unique ‘fingerprints’ extracted from the video segments with fingerprints in a specially compiled database.

Unlike watermarking technology, whereby metadata information is embedded into the audio and/or video content, the Fingerprint technology can identify a video by extracting specific characterization parameters of a video file, which are translated into a bit string or fingerprint. The content can be identified by comparing the fingerprints of a video file received, for example, over a peer-to-peer (P2P) network, with the fingerprints of previously stored original video files in a central database.

The robust fingerprint extraction system can deal with severe degradations, such as low-bit-rate video compression, scaling, cropping and noise addition. In addition, it can recognize a video from a segment as short as 5 seconds, anywhere within the video material, and it is capable of monitoring hundreds of video channels in parallel using a single server system.

Philips Video Fingerprinting is part of an array of watermarking and fingerprinting products commercially available from Philips Content Identification.

What’s new

What’s new

Next Simplicity - Sense and Simplicity in action

The first series of Next Simplicity shows held in Paris, Amsterdam, and New York were more than just an opportunity for Philips to show its key stakeholders and customers, along with the press, what could be coming out of the company in the next 3 to 5 years. They are also probably the best demonstration of Sense and Simplicity in action.

By Andrew Woolis-King

Photography: Philips Capital Photos / Nils van Houts
Sense and Simplicity is not just some here today gone tomorrow, marketing slogan destined to be replaced by more meaningless hype in just a few years. When Philips unveiled its brand promise in September 2004, those two carefully chosen words described not only what customers could expect but also the culture to which one of the world’s largest and oldest technology companies intended to aspire in the 21st century.

It marked Philips’ intention to make a deep, fundamental shift towards being a market-driven company focused on its customers’ needs. Then, and only then, would it focus on how to best meet those needs through market-leading innovation and design, and even organizational culture.

“This is the complete opposite of how we and most other technology companies used to do things,” expands Rens Rugebregt, a senior project leader within Philips Applied Technologies. “In the past we would focus on things like product and technology roadmaps and how to make rapid progress. The problem is that if you’re not careful, over time you can find you’re holding the incorrect roadmap and effectively working very hard at progressing more quickly in the wrong direction.”

“The fundamental idea is that the typical end user has got to be able to use the technology – i.e. in a way that makes intuitive sense and where all unnecessary complexity is removed;” continues Rugebregt. “For example, if I want to record a TV program I primarily just want to push a button that says ‘record’ and that’s it. I certainly don’t want to worry about setting dates, start/stop times, recording duration, and adjusting sound or display levels. While some users may want to venture into this – it shouldn’t be required at the first level of interaction.”

Making Sense and Simplicity work requires total commitment from Philips staff and partners, as well as education of what the concept means and how it can lead to products and features that customers are crying out for. The annual series of three identical one-week Next Simplicity events, hosted at various locations around the world, are designed to provide just such a tangible forum. The first series of shows were held in Paris (September 2005), Amsterdam (November 2005) and New York (February 2006). This time, London, Hong Kong and Brazil will be the venues. Each event comprises daily two-and-a-half hour exhibitions of working concepts designed into functioning application and illustrator demonstrations. Everything is based on Philips technology that is capable of being commercialized within the next three to five years.

Although Next Simplicity is ostensibly run to celebrate the September 2004 ‘Sense and Simplicity’ brand promise launch, it is much more than this. It is where the future literally takes root in the present with stunning ideas, exhibits and technology demonstrations designed to show Sense and Simplicity in action and to challenge both Philips and its partners to truly broaden their horizons in brand new ways.

While some companies have been so impressed by what’s been on show at Next Simplicity they’ve tried to place orders, this isn’t the point of the show. “None of the concepts at Next Simplicity are ready to become products at this stage and some will never be taken any further forward,” explains Geert van Kuyck, senior VP of Philips Global Marketing Management. “They’re simply proposed to challenge Philips and its partners to open their minds to the possibilities engendered by Sense and Simplicity. By being able to see, touch, feel, smell the future in the present - if only for a moment – our people see the world through a new set of eyes.” (see sidebars on next pages for some examples.)

“While Sense & Simplicity is not difficult to understand, it is difficult to do.”
Geert van Kuyck, senior VP of Philips Global Marketing Management

Embracing change
While Next Simplicity is undoubtedly a wonderful and powerful event, the underlying paradigm shift to Sense and Simplicity will not happen overnight without significant change and even disruption of old, comfortable routines and thinking patterns within Philips.

“Next Simplicity concepts are proposed to challenge Philips and its partners to open their minds to the possibilities engendered by Sense and Simplicity.”

“I think we need to be honest about the fact that it will take time for Sense and Simplicity to truly filter down to everyone within the organization,” says van Kuyck. “There has been a lot of internal debate – some quite heated – about what Sense and Simplicity means; this is entirely natural and understandable. But seeing it work in practice helps to accelerate the process and generate commitment. This is one of the primary benefits of the Next Simplicity events.”

“When I first asked for resources from my department for Next Simplicity, there was a lot of apprehension and even some skepticism,” admits Rens Rugebregt who is responsible for realizing functional technology demonstrators via a team of 50 people for Next Simplicity. “The staff were apprehensive about the scope of the challenge and the prospect of working across multiple disciplines with new people. But as they began to engage...
their colleagues from Philips Design and Philips Research, as well as the Product Divisions, they began to realize what kind of new technology ideas, innovations and synergistic opportunities that would otherwise have been impossible, suddenly become possible. As a result, any skepticism was very quickly replaced with incredible passion and enthusiasm. In a way, the Sense and Simplicity concept suddenly became real before their own eyes, and how it would rely on their individual, unique contribution and talent to fulfill its potential."

The brand is more than a logo

This for Rugebragt, is the most important function of the Next Simplicity events: demonstrating what happens when bridges are built between disciplines in the common quest to focus on what customers really want and need. Within Philips these bridges typically span Design, Research, Applied Technologies and Product Divisions. Philips Applied Technologies, for example, is the department responsible for turning design ideas such as those from Next Simplicity into real-world prototypes and, in time, commercially viable products.

“Next Simplicity is a brilliant vehicle for demonstrating the true meaning of Sense and Simplicity and Philips’ focus on the customer,” says Rugebragt. “After attending the event you begin to understand that the customer doesn’t just buy a box – they buy many things be it, for example, an experience, a capability, a new convenience, a warm sensation, reassurance or even comfort. And the brand, therefore, is more than just the Philips logo. It is a reinforcement of the customers’ expectations of the product that the logo is displayed on and what that means to them.”

That’s a lot to ask of a slogan. But as Geert Van Kuyck is quick to point out, Sense and Simplicity is more than words; it’s Philips’ guarantee that it’ll never become a moribund dinosaur facing inevitable extinction. Instead, the fundamental shift described by the Sense and Simplicity phrase is the catalyst for a culture of ingenuity, passion, and innovation typical of a start-up, but underpinned by the required resources and expertise of a giant company to actually make it happen.

“Next Simplicity demonstrates what happens when bridges are built between disciplines in the common quest on what customers really want and need.”

Rane Rugebragt - Philips Applied Technologies

“While Sense & Simplicity is not difficult to understand, it is difficult to do,” explains Van Kuyck. “The words define the process we must engage in order to meet the end user’s changing needs, expectations and requirements. But more than that; it superbly encompasses how we want to move forward. I passionately believe that Sense and Simplicity is the most wonderful, bold and brilliant positioning vision statement of any high technology company in the world today. And at present I know of no better communication vehicle than the Next Simplicity events.”

Geert van Kuyck • Senior Vice President of Philips Global Marketing Management • geert.van.kuyck@philips.com
Rane Rugebragt • Philips Applied Technologies • rane.rugebragt@philips.com
Extra info: www.research.philips.com/password • Next Simplicity

Soft therapy

This is essentially a therapeutic jacket using a healing and calming combination of light, warmth and vibration massage. The LED-based lighting system was supplied by Marijs Kraans of Philips Research.

Herbarium

The Herbarium is essentially a kitchen shelf greenhouse that grows fresh herbs without the need of specialist gardening knowledge. It creates an optimal mini-climate around the plants where all the control complexity is hidden from the user and contained within the seed pads.

Chameleon

The Chameleon high-power LED lamp changes color according to the color of objects placed in front of a small Red-Blue-Green (RGB) primary color sensor. Because it is based on solid-state lighting, the range of achievable colors stretches into millions.

In Touch

The In Touch screen is an electronic whiteboard that lets users record and receive messages (including video) by touch control alone. The concept was built out of a high-quality display with an optics system along the edges to detect motion and objects placed on the display surface. The display can distinguish between, for instance, a finger or a stylus and change its mode of operation accordingly (with a stylus it will automatically make a sheet of paper appear that will reduce down to the size of a post-it note if the message is short).
Medical technology – saving lives, reducing costs

Thanks in no small part to modern medicine, we now live longer and healthier lives than ever before, with the average life expectancy for men and women in many western countries already nearly eighty. However, the healthcare that gives us this longevity comes at ever-increasing financial cost. By the end of the decade it is predicted that healthcare spending will consume around 10% of world GDP – equivalent to almost 4000 billion dollars per year. We take a look at how new technologies being developed at Philips are set to create a win-win situation for everyone, not only improving the quality of patient care but also reducing healthcare costs.

By Peter Harold
Photography/illustration: Philips, Korff & van Mierlo, Michel Klip, Storm Scott
In the constant struggle to improve people’s lives while reducing healthcare costs, medical technology has made major contributions. In many cases it has resulted in better patient outcomes while lowering the cost or increasing the economic value of medical procedures. In the area of heart disease, today’s biggest killer in the western world, new technologies for diagnosis and treatment have more than doubled survival rates over the last 25 years. As part of the hospital and the home by creating unobtrusive monitoring systems that continuously monitor patients as they go about their daily lives and that automatically communicate significant changes to their healthcare providers.

Better educated about their medical conditions through the rich resources available on the Internet, people are also exercising more control over their own lifestyle, health and well being.

“Whenever we think about new systems, we put the patient at the center and ask ourselves – how can we help to make sure they get into and out of the care cycle as quickly as possible and in as healthy a state as possible!”

Paul Smit, Senior Vice President for Strategy and Business Development at Philips Medical Systems

Philips’ mission to deliver technologies that improve people’s lives, Philips Research and Philips Medical Systems work closely together, focusing their research firmly on the needs of patients as well as on those of healthcare providers. Today, one in every two minimally invasive catheterizations for the treatment of heart disease is conducted with the aid of a Philips X-ray machine.

A patient-focused approach

“Whenever we think about new systems, we put the patient at the center and ask ourselves – how can we help to make sure they get into and out of the care cycle as quickly as possible and in as healthy a state as possible!”, says Paul Smit, Senior Vice President for Strategy and Business Development at Philips Medical Systems.

And one of the most effective ways to speed patients’ progress through the care cycle is to eliminate the boundaries between different parts of the system. For example, Philips is bridging the gap between

The patient-centric care cycle

“...and that’s the thinking behind the new TV-based Motivus system for chronic disease management that Philips has developed and is now part of Philips Consumer Healthcare Solutions,” says Smit. “The Motivus system allows people to take greater ownership of their healthcare. It’s highly specific to chronically ill patients and it significantly reduces healthcare provider costs by objective monitoring and positively influencing patient behavior, and so reducing the need for patients to visit their doctor for routine advice.”

A paradigm shift

However, there is a set of new technologies now emerging that will make a bigger impact on the diagnosis, treatment and management of disease than anything that has gone before. By detecting the precursors of disease at the molecular level in the body, the new era of molecular medicine will allow many diseases to be detected and cured well before the patient suffers any symptoms. For leaders in the field of medical technology such as Philips, it poses some significant challenges, not least of which is the development of ultra-sensitive biosensors that can detect specific molecules in a patient’s blood at concentrations equivalent to a grain of salt in an Olympic swimming pool. With its expertise in microelectronics...

New Life Sciences Facilities on High Tech Campus Eindhoven

In October, Philips Research opened its new Life Sciences Facilities on the High Tech Campus Eindhoven, the Netherlands. These facilities are optimally equipped for the multidisciplinary research that is required for rapid progress in molecular medicine. Pre-clinical research projects will be carried out in cooperation with a variety of partners from academia and industry. Working together with academic hospitals in the Netherlands and abroad, the results can be translated into clinically relevant settings.

Philips GEMINI TF

Philips GEMINI TF is the first positron emission tomography/computed tomography (PET/CT) system to market that features TruFlight technology, utilizing time-of-flight (TOF) reconstruction, creating a new benchmark in spatial resolution and sensitivity. TruFlight technology measures the actual time difference between the detection of two coincident gamma rays, which is then used to more accurately localize the origin of the excitation. Improved event localization reduces noise in image data resulting in higher image quality, shorter imaging times or lower dose to the patient. This technology enables the detection of small lesions, which helps detect disease in its earliest stages, and permits higher levels of patient throughput, shortening exam time, allowing greater comfort for patients and increasing efficiency for busy departments.

A Gemin TF PET/CT system
nanoelectronics and advanced materials science, this is something that Philips Research is already well on the way to achieving.

“One of the first enablers for this paradigm shift to molecular medicine will be progress in the combined morphological and functional imaging capabilities of medical scanners to make them highly sensitive to specific diseases,” says Hank van Houten, Senior Vice President at Philips Research.

Through improvements in functional imaging, such as the addition of time-of-flight detection to Positron Emission Tomography (PET) in combination with Computed Tomography (TruFlight PET-CT), together with the development of biochemical markers that allow specific molecular processes to show up on medical scanners, Philips Research is already contributing to this progress.

Advances in genomics, proteomics and biomedicine have made it clear that diseases and their potential cure are associated with specific processes at cellular and molecular level. A great deal of scientific work therefore needs to be done in order to arrive at a better understanding of disease pathways at these levels, which is the focus of an emerging area of research known as ‘systems biology’. In-vitro molecular diagnostics and in-vivo molecular imaging, both of which are key new research areas at Philips, will play an important role in translating the insights gained from systems biology into clinical practice.

Given the multidisciplinary nature of research into molecular medicine, partnerships will inevitably be the route to rapid progress. That is why Philips has already embarked on a global program of collaboration with key academic sites and expanded its own team at Philips Research with experts in areas such as molecular biology, biophysics, nuclear chemistry, microbiology, biochemistry and bioinformatics. It has also opened new Life Sciences Facilities on the High Tech Campus in Eindhoven (the Netherlands) to give them a state-of-the-art environment in which to work.

“We are at the beginning of a new era in medical care,” says van Houten. “Science-based innovation in instrumentation, molecular biology and remote disease management, together with new business and organizational models, will enable Philips and its partners to create entirely new approaches to the diagnosis, treatment and aftercare of disease. For patients, it will lead to better outcomes, less traumatic experiences and an enhanced quality of life. For healthcare providers and payers, it will contribute to more cost-effective healthcare systems through the delivery of easy-to-use tools to healthcare professionals.”

Philips partners with BG Medicine

In August 2006, Philips reached a development partnership agreement with BG Medicine, a privately held company based in Waltham, Massachusetts (US). Under this agreement, Philips Research will collaborate with BG Medicine to advance Philips’ development of patient-centered diagnostics and personalized medicine, and Philips will take a minority stake in BG Medicine.

The collaboration gives Philips access to certain BG Medicine proprietary biomarker discovery and validation technologies, and associated services. Biomarkers are specific molecular or cellular components or events that indicate the presence of a disease, and may be used to tailor therapy to the individual patient. Validated biomarkers are key for the implementation of Philips’ molecular diagnostics technologies and molecular imaging solutions. They enable the detection of a given disease at an early stage, and can be used to monitor the effectiveness of the subsequent therapy.

Motiva – a TV-based platform for remote patient management

The Philips Motiva system – a groundbreaking TV-based platform for remote patient management – engages patients on a daily basis with personalized interactive content, while helping care managers to reach more patients, better influence long-term behavior and lower healthcare costs. It does so by turning a patient’s TV set into his or her own, easy-to-use personal healthcare channel or ‘virtual health coach’. Through this channel, nurses can educate, motivate and communicate with their patients, and patients can continuously track a patient’s level of knowledge, motivation and confidence to achieve specific health goals related to the patient’s condition.

In a usability study conducted in early 2005 in New Jersey, Motiva earned high marks from patients as old as 81. “If you know how to press a button, you know how it operates. The TV screen tells you everything you need to do,” commented one of the patients.

Nurses found the system helped to improve their connection with patients. This usability study was followed in June 2005 by a trial of Motiva in the Netherlands by leading Dutch healthcare insurer, Achmea.
Satisfying a burning need

A revolutionary woodstove design will improve cooking conditions in developing countries. By burning more efficiently, the stove reduces the demands on the existing energy supply chain. It also cuts the smoke and toxic emissions that cause 1.6 million deaths a year. The stove could benefit up to 300 million families in the world’s poorest regions.

By David Hegarty

Photography/illustration: Philips, Storm Scott

The secret to the efficiency of the stove is a long-life, brushless fan that forces a controllable flow of air through the stove from below. To start the oven, the cook lights the fuel (typically wood or charcoal) and then switches on the fan, which runs on a rechargeable battery. The fan improves the fuel to air ratio, helping the stove reach cooking temperature in as little as a fifth of the time taken by a traditional, three-stone fire. Once lit, the flow of air ensures a higher burning temperature.

Philips Research carefully chose the materials used to build the stove for low thermal mass and high isolation. Low thermal mass means the stove absorbs less energy, so it reaches cooking temperature faster. High isolation ensures the stove loses less of its heat to the surroundings, so more of the heat is available for cooking. The regulated airflow makes the heat output more stable and controllable. This is more convenient for cooking.

As the oven gets up to temperature, a thermoelectric generator slowly takes over from the battery to power the fan. When the oven is at its final temperature, the generator also recharges the starter battery.

Paul van der Sluis, woodstove project leader, Philips Research

We made some good choices early in the project, before we really knew how important they were.”

A new challenge for old technology

Though the technology in the stove has been viable for the last ten years or so, getting such a stove to work is not a trivial matter. A few teams have already tried to get this principle to work, but none have yet fully succeeded. As Paul van der Sluis, project leader for the woodstove at Philips Research, explains, “We made some good choices early in the project, before we really knew how important they were.”

The main problem is with the electrical efficiency of the system. The generator is...
made up of P-type and N-type alloys of bismuth and tellurium, sandwiched between ceramic plates. When a temperature difference is maintained across this sandwich, electrical power is generated. This power is used to run the fan.

For all of this to work in the woodstove, there has to be a large enough difference in temperature between the hot side of the thermoelectric generator (facing to the burning wood), and the cold side of the thermoelectric generator (facing the outside). To achieve this, the fan also has to cool the cold side of the generator. Obviously, it has to use less energy for both fanning the flames and cooling than the generator produces. This was the greatest problem the research team had to solve.

**Improving quality of life**
The airflow through the burning wood gasifies it and these gases are burnt with preheated secondary air. This results in cleaner burning and more efficient use of the fuel. A field trial in India in late 2005 showed that, when used properly, the woodstove typically reduces fuel consumption to a third of that used by traditional, three-stone fires. This alone contributes to a better use of the available resources, and could slow deforestation. But perhaps more significant is the advantage to the people using the stove. Apart from faster and more convenient cooking, the greater energy efficiency means the stove needs less fuel. This saves the cost or the time taken to gather fuel. It also burns the fuel completely and inside a portable container, which saves the time and effort of cleaning up afterwards.

While there is some room in the design to further increase the efficiency of burning, there is a more important goal. By optimizing the airflow to burn the fuel as cleanly as possible, the woodstove reduces indoor air pollution. “The World Health Organization has identified indoor air pollution as a major risk to the health of women and children in the world’s poorest countries,” says Paul van der Sluis. The ‘World Energy Assessment’ estimated the smoke from indoor wood or dung fires for cooking was the equivalent of smoking two packets of cigarettes a day. These people still have to cook, and “it was this that first prompted us to explore sophisticated, sustainable technology that was still affordable and practicable for a great many of the world’s poor,” he adds. The woodstove reduces pollution from smoke to a tenth, and organic volatile emissions to one-hundredth of the level of traditional, three-stone cooking fires. Aprovecho, an independent testing facility, has found the woodstove to be the cleanest burning stove they ever tested.

**New markets**
Philips Domestic Appliances and Personal Care will start a commercial pilot in India. The results of the first pilot should help decide how Philips can best partner with other companies and organizations to make, distribute and market the woodstove successfully.

---

1 The World Energy Assessment is a joint publication of UNEP, the UN Department for Economic & Social Affairs and the World Energy Council.

Paul van der Sluis • Philips Research • paul.van.der.sluis@philips.com
Extra info www.research.philips.com/password • woodstove

The woodstove has been tested extensively in field trials.
today
In many cases, playing electronic games is a solitary, virtual experience.

tomorrow
Entertaible is a multi-purpose tabletop gaming platform that allows the players to engage in a new class of electronic games, which combines the features of computer gaming with the social interaction and tangible playing pieces of traditional board games.