The design of interiors, alongside the other design disciplines, is a vital task in the shaping of our built environment. In this book, an international and interdisciplinary team of authors gives an extensive account of today's main areas of work in interior architecture and design. Illustrations of contemporary projects, selected consistently throughout the book, cover the breadth of typical interior design tasks as well as a wide range of possible design approaches. This book is a fundamental reference work for all those professionally involved in the design of interiors.
DESIGNING INTERIOR ARCHITECTURE
DESIGNING INTERIOR ARCHITECTURE

CONCEPT
TYPOLOGY
MATERIAL
CONSTRUCTION

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Working within the interior design industry is a privilege and an ever-changing experience. As design students we are taught that anything can be created and not to give up on our ideas. Reality kicks in once the theory days of study are over. However, I believe it is still possible to be inspiring, innovative and different within the constraints of budgets, regulations, client's requirements and timescale.

During my career as an interior designer, spanning more than two decades, I have worked across several sectors including workplace, hotel, restaurant, offices, exhibition, residential and healthcare. Whatever the brief, the fundamental elements of the design process remain the same.

The challenge that exists on the international market is to produce designs that are relevant, responsible and appropriate. As International Director for the British Institute of Interior Design, I have been fortunate enough to personally meet and connect with design communities around the world. Despite cultural and language differences, there is a common bond between them. We share very familiar problems, issues and obstacles, in a way that is both refreshing and frustrating. Interior design is good and will enhance your life, this is the message we deliver and that does not always get heard.

A trend that has become evident to me through my travels is the ubiquitous desire to be part of the interior design circuit. The list of countries now staging regular large-scale interior design-focused events includes India, Singapore, Russia, Brazil and China. They are more than keen to take on the established events such as the Salone Internazionale del Mobile in Milan, Neocon in Chicago, Orgatec in Cologne, 100% Design in London and Maison et Objet in Paris. With so much competition, are we in danger of design overload?

The increase in our appetite for interior design on a global basis has resulted in positive acceptance of the idea that interior design has meaning and purpose. While the image of being a quick fix on a budget will not disappear overnight, the media are better informed and perhaps a little less cynical today. The importance and influence of good design is widely recognised, particularly in the retail and hospitality sectors. Increasing the financial bottom line is the focus of all business, which is where good design can make a significant difference. The experiences created for customers, whether in a fast food chain, a Grand Hotel, an airport lounge, a shopping mall, a cinema or restaurant, are carefully managed. This applies also to workplace and leisure environments design.

As we live longer, our standard of living improves and our expectations inevitably rise. The middle classes of emerging economies have the money to spend and want to be invited to the party and to exchange. This is driving rapid development of new towns, railways, ports and infrastructure but we have to ask at what long-term cost? Our human condition craves change and progress and we are aware it is unstoppable. Striving to discover new and different things is part of our natural drive. We should not fight it but learn from the mistakes of the past, where forecasts for growth and demand have been over ambitious in certain areas. With a global recession like no other, affecting most countries in the world, we are now in a state of fear and sometimes panic.

Using design to bring people together and have better lives is possible, even if this may be a Utopian view. As the global population grows beyond seven billion people, there are more basic needs to provide. Food, water and shelter are still not available in some regions of the world but good design continues to help resolve this to some degree. Travelling to India on more than one occasion, I found it difficult to reconcile with the immediate and ubiquitous poverty, when there were well-catered, smart presentations taking place in plush hotels 10 minutes away. A huge programme of growth and development is in place, but the enormity of the task means the timeframe for any noticeable change is protracted. India is not the only country with this mission on its national agenda.

It is important to recognise that interior design has a responsibility to ensure that we are improving the quality of life for the mass as well as prolonging the earth’s life rather than destroying it. Unfortunately, political and economic agendas are also part of the equation, that can steer the sustainability approach off course. However, there are a number of locations like Abu Dhabi, Australia and Singapore where they are taking the lead in green matters rather than just paying lip service to the ideas of protecting our future.

As an ambassador for British design, it has been exceptionally rewarding to meet different design communities and interact. I have also witnessed how much British design education and creativity is admired and respected around the world. On every trip, whether to Chicago, New Delhi, Paris, Toronto or Milan there was always a very positive reception. In Japan I encountered particularly high respect for designers from the UK that goes some way to explain Paul Smith’s huge success in that region.

Working across several sectors has taught me a lot about the interior design business and the variations that exist, but ultimately the task is always the same: we begin with a vision of creating something unique, beautiful, relevant, something making an improvement on the existing. To have the opportunity to be part of someone’s life or company for a brief period can be a challenge but also educating, rewarding and inspiring. The term “journey” may be clichéd, but it describes best the chain of events that defines the design process.

The essence of appealing internationally is to identify the soul of the design, whether it is a product or space. The international success of leading British designers such as Sebastian Conran, Tricia Guild, David Linley, Paul Smith or Lee Broom is their understanding of the local markets. More importantly, they share the creation of a message and identity and promote it with confidence, humour and personality.

The popularity of vintage, bespoke and heritage products and spaces is a contradiction to our need for the familiarity of brands and identities that we are bombarded with in everyday life. We have the ability to strike our own balance between these two competing worlds through personal selection. An eclectic mix, in varying degrees, is becoming more common and a truer reflection of who we are as people. The bland and impersonal, minimalist and highly polished style of the late 20th century is associated with false promises that we would share in the success of a highly developed world with big financial gains all round. Now that the bubble has well and truly burst, we find ourselves responding to a more human and intimate scale of ideas and solutions.

I believe that science and design will have a much closer relationship in the future than we may recognise today, as we currently exist under a heavy digital blanket. In order for the world to function well, it needs to use its limited resources with caution and discover and invent new technologies or materials, which are affordable and realistic for the future generation.

FOREWORD

BY SIMON HAMILTON

Simon Hamilton & Associates Ltd; International Director, British Institute of Interior Design (BiID)
Interiors are the architecture of the future. Design and architecture are no longer fashionable but are expected to provide specific answers to user demand and the need to improve our well-being. Health, safety and well-being have become important social themes, not least in the Western world where a shrinking and aging population corresponds with an increasing need for individual and small-scale design of the living environment, calling for particular attention to re-use and sustainable development. Well-designed interiors add value to the perception and quality of use of our immediate living environment, to our feeling of well-being and to the quality of life.

Interiors are the architecture of change. The life-cycle of a building knows many users and is subject to a continuous change of views. A building is never finished, giving every user the opportunity to attach their narrative to it. Interior architects/designers give shape to a sustainable renewal of buildings. While preserving the specific and sometimes unique architectural qualities, we provide and care for generation after generation to feel at home.

Interiors are the architecture of perception. One of the factors that determine the appreciation for our environment is time. Light and dark, as well as the changing of the seasons, have a defining effect on the perception of interior space. Fashion and trends play an important role as well. We are challenged by the new, but also nourish the known and well-acquainted. Pushing boundaries is a unique aspect of human nature, as is the need for meaning and a sense of security. Habituation is a special trait; much of what we encounter as strange and ugly at first sight will be valued over time. Aging, by contrast, is not a uniquely human condition. Materials age and wear. Sometimes that presents a new beauty, a patina we nourish or even try to imitate.

Interiors are the architecture of emotional culture. In a nice and stimulating environment people experience more commitment, more pleasure, satisfaction and success. People have a desire for association, expression, remembrance and beauty. They want to identify with their environment. This means that an environment ought to provide space for individuality and self-expression, which in turn offers new perspectives for improvisation, spontaneity, vision and imagination. Interactive encounters and ergonomic quality are key to accommodate socio-psychological aspects in a working environment. The “emotional house” may foster new modes of efficiency and productivity. In public interiors as well, it is important to explore the functional potential of perceptual aspects, creating places that command desirable behaviour. People are easily influenced but want to be taken seriously.

Interiors are the architecture of cultural history. Beyond their role as a utilitarian interface between user and building, interiors are the expression of our cultural identity and ambition. The decoration and design of our immediate environment is a time-honoured art. Intact historic interiors can tell us more about the culture, the fashions and habits of a certain place and time than in-depth scientific studies. However, intact historic interiors are even rarer than Old Masters paintings. Interiors form the user side of buildings and give meaning and value to them, but the user side is also vulnerable. Interiors are bearers of culture, but ever so often we remake them as they are overtaken by time.

Interiors are the architecture of responsibility. Designers take into account the consequences of their professional activity for the health, safety and well-being of all those who may reasonably be expected to use or enjoy the product of their work. This way of looking at design, going well beyond superficial styling and decoration, requires training, experience and an openness to life-long learning. It also needs a bent for research and development. But above all, it calls for a love for people.

May this book be of assistance to those designers.
“Human-centred” is a term encountered regularly in the context of interior design because our spatial surroundings have such a fundamental influence on our lives. We are all aware of the value of spatial qualities, whether as a means of improving our sense of well-being in a space or for facilitating work processes. The architectural design of interiors influences our emotional sensibilities and in turn how we behave. It can communicate an attitude, provide an atmosphere of trust and safety, reduce anxiety, be relaxing, stimulating or alternatively reassuring. It influences our motivation to work, our sense of responsibility or disregard for a space, and it can be soothing or disquieting, spiritng or depressing. The design of spaces and their atmospheres affects the behaviour and well-being of everyone involved.

PUBLIC IMAGE

Interior design is generally perceived as lying between the poles of architecture and design. In the media and popular press, it is commonly portrayed as the furnishing of luxury residences, an image reinforced by the plethora of TV interior makeover shows. The role of interior architects and designers is often confused with being that of “interior stylists” and, in an international context especially, they are perceived as being solely interior decorators. But interior design encompasses much more than that, and this is what differentiates professional interior designers from the clichéd image. Professionals will have completed a comprehensive programme of studies and work on a broad range of tasks that go far beyond that of luxury villas.

The field of interior design lies between those of other professions: on the one hand, there are architecture offices who work on the renovation and modernisation of existing buildings, traditionally a primary field of interior design; and on the other there are design agencies who create interiors as part of lucrative branding contracts. This situation, while problematic for the profession, also demonstrates that interior design is more in demand than ever.

The core aspect of interior design work is the design concept itself. Designs are usually characterised by different individual interpretations of the task: a personal style or signature. One and the same design task can embody differing degrees of creative and intellectual potential. In practice, professionals must adopt a standpoint that also defines how they see themselves and their own approach to work in their profession.
Interior designers have the skills and know-how to shape the quality of interiors for their future use, whether in a private house or for a large corporation. The spectrum of activities in the field of interior design is very broad and ranges from furniture design and product designs for industrial manufacture to designing in existing fabric. So who is responsible for giving interior design a distinctive profile in the public arena? Who are the iconic interior designers of the day? Names that immediately spring to mind include designers such as Philippe Starck and Andréée Putman, or global design pop stars such as Karim Rashid or Marcel Wanders: the first is a universal genius at home in all genres from pasta to high-rise buildings, the second is the *grande dame* of interior design, and the last two are product designers who also work in the field of interior design. Further examples include offices, such as Concrete and Nendo or Kelly Hoppen or Shiro Kuramata, who create contemporary interiors, as well as Eileen Gray as a historic milestone and early protagonist of interior design. The number of “icons” in the field of interior design is modest in comparison to that of those in the field of architecture, which indicates that the interior design scene is not adequately represented in the public eye. While there are more than enough coffee-table books and popular magazines, their general focus tends to be on interior decorating, and the featured interiors span the range from spaces designed by professional architects and interior designers to private houses designed by non-professionals, ranging from “Mr Big Shot’s wife” to married couples with artistic ambitions. Glorified cushion arrangements for home living. Compared with architects, interior designers are very much in the minority: good interior designers are rare and valuable. While the proportion of women within the profession is relatively high compared with other branches, especially during studies, this proportion decreases later when it becomes increasingly difficult for women to balance career and children. The resulting lack of professional female interior designers does not help to strengthen the image of the profession. Instead, the cliché of “Barbie the interior designer”, which still prevails in some sectors, only reinforces the view of interior design as a kind of “pastime for women”.

Climbing deluxe: this climbing wall in a fitness club plays off its location in a fashionable district of Tokyo – interior decorations as climbing aids: picture frames, mirrors, vases and deer heads.

Illoïha Omotesando Fitness Gym, Tokyo, Japan; Nendo
SUSTAINABILITY THROUGH INDUSTRY STANDARDS

Within the building sector today, it is universally accepted that buildings contribute in a significant manner to climate change through both consumption and emissions. In the EU, buildings account for 40% of its annual energy consumption and 36% of its CO₂ emissions.¹ Similarly, the American building sector consumes nearly half (49%) of all energy produced in the USA and is responsible for 46% of its CO₂ emissions.² The fact that “buildings are the major source of global demand for energy and materials that produce by-product greenhouse gases (GHG)”³ has generated initiatives worldwide to reverse this trend by reducing and maintaining a global average temperature of less than 2°C above pre-industrial levels. The building sector constitutes the single largest economic and environmental opportunity for a collective reduction of GHG levels.

The European 2020 Strategy and the American 2030 Challenge aim to achieve 20% energy savings as initial steps toward long-term energy and climate change goals. These goals may be met through the adoption of sustainable practices that promote integrated whole-building planning, design, construction and operation, innovative design with minimal environmental impact, building management with a reduced life-cycle impact on the environment and even on-site production of renewable energy. Such practice extends well beyond the building profession to management, education, development, business and real estate. While sustainable practice has been in use for some time, especially in Europe, it is relatively uncharted as a global endeavour. Environmental assessment methodologies, in the form of rating systems, have emerged in order to provide some measurement of the efficacy of such practice. There are over 600 such rating systems worldwide today and they fluctuate in scope, from one to the next, in measuring the different aspects of sustainability - social, environmental and economical.
Focused: “This house evades the mechanics of the camera... One must actually stroll through the house to grasp its complexities and its connection to the exterior.” (The architect)
Wilkinson Residence, Portland, Oregon, USA; Robert Harvey Oshatz

The building has 6 Star Green Star – Office Design v2 certification from the Green Building Council of Australia and is regarded as a benchmark of sustainable architecture.
ANZ Centre, Melbourne, Australia; HASSELL
RATING SYSTEMS

Green rating systems are tools that “examine the performance or expected performance of a ‘whole building’ and translate that examination into an overall assessment... for comparison against other buildings”. The development of these systems began in the UK with the introduction of BREEAM (Building Research Establishment’s Environmental Assessment Method) in 1990. This was followed in succession by the French system HQE (Haute Qualité Environnementale) in 1992, the Hong Kong BEAM (Building Environmental Assessment Method) and the international GBTool (now SBTool) of the iiSBE (International Initiative for a Sustainable Built Environment) in 1996, the USA LEED (Leadership in Energy and Environmental Design) and the Canadian Green Globes in 2000, the Japanese CASBEE (Comprehensive Assessment System for Built Environment Efficiency) in 2001 and the Australian Green Star in 2002.

These form the basis of many other similar systems around the world including Switzerland’s Minergie, Germany’s DGNB System (German Sustainable Building Council), Portugal’s LiderA, Singapore’s BCA Green Mark (Building and Construction Authority), and Taiwan’s EEWH (Ecology, Energy Saving, Waste Reduction and Health). Many countries have also adopted rating systems through their membership and chapter in green building councils and organisations such as the World Green Building Council. Today, BREEAM and LEED have emerged globally as the two most recognised and used systems.

The character of the outdoor areas is continued into the interior of this office for a furniture manufacturer.
Samas Office Furniture Headquarters, Worms, Germany; 100% interior Sylvia Leydecker
Most rating systems consist of a suite of tools that assess a building through its construction type and space use. Construction type differentiates between new and existing construction with further distinctions, in some systems, of core and shell, commercial interiors and limited construction/operations and maintenance. Space use categories include retail, healthcare, education, commercial, industrial, domestic and community development. The systems universally address issues of global and local environments, internal environment, design assessment, operation of the building and its management. Some systems also have the capability for assessing the management, operation and maintenance of a building at any post-occupancy period. Rating categories are further separated into land use, water use, energy and the atmosphere, transport, materials, indoor environmental quality and, in some cases, innovation. Within a system of designated points, an assessment of the whole project is premised on the total points earned from each of the categories. Most systems weigh the points equally with the sum total leading to a rating of the building. The ratings differ from system to system, with star ratings from 1 to 6 for Green Star, bronze/silver/gold/platinum for LEED and pass/good/very good/excellent/outstanding for BREEAM.

There are many similarities in the general organisation of rating systems – each with the primary purpose of measuring the sustainability of the built environment. These tools ultimately serve an extensive circle that surrounds the primary user group of built environment professionals and includes developers, building management, members of the real estate sector, manufacturers of materials and products, code officials, organisations for the protection of the environment, sectors of the health profession and even building tenants. While some rating systems were developed in conjunction with government-related agencies (Green Globe, BREEAM), many rating systems were developed by private, non-profit organisations. The major rating systems set strict standards for practice and contrast with “green” building codes that establish minimum requirements for sustainable practice. The rating systems are voluntary and not generally integrated with governmental building regulations, although in some countries, rating systems are adopted and enforced as building regulation. In the UK where BREEAM was developed by the Building Research Establishment (BRE), at the time a government-funded research body, local governments have begun to require compliance with BREEAM as part of their planning policies. Wales and Northern Ireland have both adopted sections of the BREEAM system into their local codes. In Wales, as of July 2008, for example, all healthcare buildings must achieve a Very Good to Excellent BREEAM assessment. In England, all new school projects must achieve a Very Good rating as a condition of funding. Interior design, as an individual discipline, is not addressed as a separate category within most rating systems. Where differentiations are made between new construction and existing buildings, interior design issues are addressed in the latter category. In many cases, the systems address indoor issues, typically termed “Indoor Environmental Quality” (IEQ), which include aspects of building performance that impact the health and well-being of the occupants. This category includes safety and security, hygiene, indoor air quality and ventilation, thermal comfort, lighting, acoustics and building amenities.

The rating systems that specifically address interior design are few and include Green Globes, Green Star and LEED. The Green Globes rating system includes the tool Fit-Up, which is both a guide and an assessment protocol for commercial interiors. Issues of Indoor Environment, Project Management, Energy, Emissions, Effluents & Other Impacts, Resources-systems Options and Materials and Water are addressed through an interactive, online questionnaire. While third-party verification is possible, Green Globes generates an online report based on a completed questionnaire. The Green Star system offers the category Office Interiors in Australia, South Africa and New Zealand. This category is designed for owners, tenants and interior designers to assess the impact of office tenancy fitout, both during the design phase as well as in post-construction. Issues include access to natural light, waste management, energy conservation, materials manufacture and use. This tool is accessible to all users, but a project can only claim such certification if used by GBCA (Green Building Council of Australia) certified individuals. LEED Commercial Interiors similarly provides a green benchmark for tenancy and high-performance interiors. Its rating categories are Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, IEQ, Innovation in Design and Regional Priority. LEED Commercial Interiors is designed for complementary use with LEED Core and Shell, as a specific rating system for developers, owners and tenants.
Tech-Nature: a facade perforated with braille dots gives this unusual pharmacy a lively and inspiring lighting effect – laboratory and nature in coexistence.
Placebo Pharmacy, Athens, Greece;
Klab Architecture - Konstantinos Labrinopoulos
EVALUATION

As evidenced by the proliferation of green ratings systems around the world since their introduction in 1990, the impact of these systems is potentially far-reaching. At a minimum, these tools have raised the awareness of environmental issues and encouraged sustainable practice in the built environment at all levels of participation from policy to planning, from design to construction, from resource to product and from real estate to tenancy. For building professionals, these complex rating systems provide a practicable structure and framework for measurement and assessment. Often these systems complement building codes and regulations and, in many cases, they exceed them. For governments, they can and do serve, in the instance of BREEAM and policies of Wales and Northern Ireland, as a link to governmental energy policies. For individuals – from building managers to tenants – they provide a method of evaluating and improving maintenance and operation of buildings that reduce their impact on the environment. This overall level of awareness should not be underestimated.

As a global endeavour, green rating systems have made significant progress in the two decades since the introduction of BREEAM in the UK. The positive impact of the systems as a worldwide catalyst for understanding sustainable practice cannot be disputed, but there are shortcomings in implementation and execution. As these systems gain wider general acceptance, common concerns have surfaced that are specific to some systems and generic to most. These concerns pertain to efficacy, consistency and cost – each a crucial aspect – and, if unresolved, could undermine the future possibilities of the system as a whole.

Pop-up hotel project for a TV programme showcasing the creative use of recyclable materials.
Recycling – Artistic room concept for a hotel, Cologne, Germany; Raumkleid – Anke Preywisch, os2 designgroup – Oliver Schübbe
The most common concern questions the premise of the ratings structure, one that is based upon a pre-occupancy condition. Designs envisioned for optimal pre-occupancy conditions are seldom translated verbatim to construction and realisation for many reasons including budget. Decisions made late in the design process, including value engineering at the completion of the design phase, contribute to the construction of a project that differs from the designed one. In this sense, the rated performance does not hold a clear relationship to the actual consumption and environmental performance of a building in a post-occupancy state. Interior design parameters that address the comfort of the occupant – temperature, ventilation, lighting, air quality – are crucial to the overall assessment of performance but are not, in fact, regulated in actual use. There are many ways to resolve this lack of definitive connection between anticipated and actual performance. The involvement of a buildings operator in the design and construction phases or the creation of the position of Environmental Performance Manager for building management are some possibilities. BREEAM addresses this concern by its recent requirement of a Post-Construction Review. For their ultimate rating of Outstanding, a BREEAM In Use certification is required within the first three years of occupancy.

**Space maximisation: flexible curtains give this tiny hotel room an intimate character.**
CitizenM Hotel, Glasgow, Scotland; Concrete Architectural Associates

**Hanging garden: sustainability is also the theme of this contact lens shop in Omotesando.**
Magic Store, Tokyo, Japan; Torafu Architects
A study of French HQE-certified buildings indicated that certified buildings, in fact, performed better than non-certified buildings, but not as well as forecasted in the certification process. This is consistent with findings around the world. Such findings, however, have not affected public perceptions of certified buildings. Real-estate market studies in the USA indicate that “green” office buildings demand higher rent, hold a higher rate of occupancy and have a higher resale value than “non-green” buildings of a similar nature. Such perception questions the rating systems’ use of points as an indication of success. There is conjecture that design professionals are more interested in the acquisition of points and owners with the economic benefits and prestige of certification than with effective sustainable design. The term “LEED brain” has been coined to describe “what happens when the potential PR benefits of certification begin driving the design process”. Such conjectures damage the reputation of the systems and their potential for influencing energy policies in the built environment.

The development of a universal rating system is a distant ideal. The regional variations of climate constitute one important factor among many that explains why the systems differ dramatically from criteria to scores. A comparison of assessment criteria for twelve different rating systems used in the UK, Asia, Europe, US and Australia that focused on fifteen key issues including energy, CO₂, Indoor Environmental Quality, land use, renewable technologies, transport, waste and water indicated that none of them used the same list of criteria for assessment. In a study published by BRE, the findings indicated that there was no equivalent for BREEAM’s rating of Excellent. A rating of Very Good in BREEAM was found to be equal to Platinum and Six Stars, the highest scores respectively in LEED and Green Star, while there was no such equivalent in CASBEE. This lack of consistency and parity between systems does not allow for a universal standard of comparison.

The cost aspect of building certification raises the issue of economic divide. While data demonstrates that the ultimate cost of a certified building is not significantly higher than that of an uncertified one, many additional costs exist in the assessment process. These so-called “soft” costs include the use of the rating system and materials, project registration fees, fees associated with certification and design team fees. Indirect costs also include the cost of time for a certification process that can take from a week to two months, fees for membership with Green Building Councils and costs of education and testing for certifying design professionals. In the USA, recent costs associated with LEED certification that included registration, document submission, AP document gathering and design team documentation ranged from 22,000 USD to 100,000 USD.

The green rating systems have made significant progress in quantifying the impact of building on the environment. Cynics, though, point to the low number of buildings certified over a period of 20 years: 200,000 through BREEAM and 9000+ through LEED. The dissemination of such quantification methodologies alone, however, is an enormous benefit. It is important, too, to recognise that no environmental assessment system is perfect. By virtue of its quantification, the system does not have the capacity to address aspects of the built environment outside this intentionally limited view. It is a tool for measurement, not for design.

Water as a luxury resource is the theme of this azure blue pool in a hotel in a medieval building.
Hotel Zenden, Maastricht, Holland; Wiel Arets Architects
One proposed solution for the reduction of greenhouse gases (GHG) is to attain fossil fuel reduction standards through implementing innovative design strategies.\(^{12}\) Despite its unquantifiable characteristics, the importance of design innovation in sustainable strategies for the built environment is recognised in some of the major rating systems. BEAM, BREEAM and LEED each address the subject of innovation as extracurricular; an achievement beyond the methods of established best practice. Innovation is rewarded with bonus points. BEAM does not provide a prescribed path for innovation; rather it allows a client to submit such proposals for evaluation and consideration. Projects assessed through BREEAM can receive bonus points either by exceeding established best practice criteria or through a proposal requesting assessment for innovation. LEED assessment criteria include specific descriptions for earning ten possible bonus points that permit a project to score 110%. Six out of these ten bonus points are allocated for innovation and may be earned through any combination of three paths: achieving significant and measurable performance not addressed in LEED, achieving exemplary performance by exceeding LEED criteria or attempting a pilot credit. This approach to ecology in the built environment addresses the demands of a changed and rapid world through strategies that embrace the intangible characteristics of flexibility, adaptability and multifunctionality.
BUILDING SMALL AND THE INFLUENCE OF ECONOMY AND ECOLOGY

At the close of the first decade of the 21st century, many industrialised countries are marked by post-industrial decline. Europe and the USA, in particular, are troubled with economic recession in what is now termed the Global Financial Crisis. In such a state, scarcity of resources, both natural and financial, is a key issue facing design today. When approached primarily through the lens of products, sustainability in design practice is often viewed as economically disadvantageous due to perceived additional costs.

Once the purview of the value engineer, reductions of project scope and scale have become a recognised approach to sustainable practice. Smaller projects typically cost less to build and maintain, consume less energy in construction and use and emit less CO₂, ultimately resulting in a reduced carbon footprint. A diminution of size does not necessarily equate to fewer programmatic requirements and functions. Rather, building “small” is accompanied by the design challenge to accommodate more within a lesser footprint.

Small structures must be flexible to perform the same programmatic roles as larger ones. Flexibility in the floor plan is historically linked to the 18th-century invention of coke smelting and its subsequent impact on the history of modern architecture. The resultant mass production of iron led to the evolution of the steel industry in the mid-19th century, a benchmark that brought about an independence from load-bearing methods. The introduction of steel framing forever changed the definition of the room. Previously restricted by the limited structural spans of load-bearing members, rooms were now freed from such constraints. With the general acceptance of steel framing in construction, the classic floor plan of the late 19th century, with its enfilade of formal rooms, gave way to the new open plan in which many functions could coexist in one undefined space. The implication of this change on the modern floor plan is noted in Le Corbusier’s untitled 1925 manifesto Architecture Vivante as one of the “five points of architecture” and further illustrated in his Domino House diagram.13 Almost a century later, this freedom and flexibility is at the heart of the challenge to build small.
Completed in 1972, the Nagakin Capsule Tower in Toyko is the quintessential precedent for both compact and environmentally respectful design. The project consists of two towers, each housing 140 prefabricated “capsules”. Each capsule was designed with built-in furniture, a bathroom unit, built-in appliances as well as a TV and audio system to accommodate the needs of a single occupant. (Multiple occupants or families could be accommodated through the connection of multiple capsules.) Responding to Tokyo’s perennial shortage of space, both commercial and domestic, this project was intended for use as homes or offices. The success of the 58 m² (621 sq ft) compact floor plan in meeting so many programmatic needs is due to the flexibility of the space itself. In contrast to the traditional floor plan in which spaces were dedicated to individual functions, a single space simultaneously accommodated many functions.

Flexible use: curtain open, curtain closed.
“Blau Fabrik” office interior, Thalwil, Switzerland; ateliersv Innenarchitektur
Materials define spaces in so many ways, not only in the more obvious form of channeling light or allowing designers to create intricate geometries. They define our environments also through association and through the stories they embody and communicate to a user. In an age where we are increasingly dependent on, and needy of, the knowledge about the provenance of the ingredients of our material world, the stories that these materials embody become more important. For instance, if designers specify materials that are in some way energy-efficient in their production, this will be communicated to the users and will become part of the personality that will define the building or space. On many levels our environments are becoming more defined by the personalities who shape them, for example, those of the architect, the owner or a company brand, each of which tells a different and personal story. We are also becoming more and more reliant on experiences that new materials are bringing to interiors. No longer just passively using a space, surfaces are beginning to give feedback. Reflections and refractions create spaces that 20 years ago would have needed very smart and advanced electronic devices to make them work.
MATERIAL LIGHT

For a surface that cries out for attention to generate a “wow” factor there are some wonderful new material combinations that capture light and channel it out in unexpected ways. As you walk across certain types of tiles you will be captivated by a dynamic spectrum of tiny shimmering lights flickering below. It may sound as if some pretty advanced technology is involved, but this surface simply relies upon the use of fibre optics embedded within a resin or concrete block. The fibre optics pick up changes in light and disperse them onto the surface, where they magically shift and move in a rippling effect. The colour and movement created all depends upon the intensity of light, whether it be natural or artificial, with more dramatic contrasts being produced when light is directed onto the surface. For instance, as you pass over the tiles, your shadow will block the incoming light, making the surrounding areas appear to light up. As the tiles contain no electrical components, they can even be used within areas exposed to moisture such as kitchens, bathrooms and even outdoors. This material should not be limited purely to flooring applications: its intriguing behaviour can enhance countertops or wall panels, as the blocks are available in custom sizes and shapes to suit the desired use.

Phase change materials exist in a constant state of flux, adapting themselves to the environment. Made up of several layers, these materials contain microscopic beads that change state – like water does when it changes to ice – depending on the temperature. When they change from one state to another they are continually storing and emitting heat. For instance, when applied to a wall plaster, as the room begins to heat up on a hot day, the beads will start to melt and as they do they begin absorbing some of the inside heat to cool the room down. By contrast, when the room begins to cool down, the beads will begin to solidify and release the stored heat to raise the temperature back to the desired level. Using this plaster helps to keep a room at a constant temperature. The beads can be programmed to activate at specific temperatures so that the liquefying and solidifying is controlled depending on the climate. Not only do these materials enhance comfort, but they also provide significant energy and cost savings in heating and air-conditioning systems.

Along a similar theme of incorporating energy systems within a material surface, lighting is currently going through incredible advancements that are rapidly redefining the way light is applied in our environments. The traditional concept of light being contained in a glass bulb will become redundant. Instead, light will soon be available as a liquid. This can already be seen in lighting no longer needing to be restricted to fixtures or fittings, as developments in organic LEDs (OLEDs) and chemical alternatives are dematerialising our traditional perception of light and affording the opportunity to integrate it seamlessly into the surrounding surfaces. Flooring, walls, tabletops can all become light-emitting surfaces, opening up an abundance of creative opportunities in the development of ambient environments.

Flexible textile room sculptures, white, transparent and back-lit, create a bright atmosphere in the windowless showroom.
Elie Tahari Fashion Showroom, New York City, New York, USA; Gisela Stromeyer Design (top and opposite page)
Organic LEDs have dramatically transformed the lighting industry with their flat electroluminescence that is incredibly energy-efficient. A technology that has typically been used within electronic devices, its benefits are now being recognised further afield beyond the limits of the screen. We are seeing the opportunity to integrate this flat film into flat surfaces such as wallpapers, to produce shapes or patterns of light any way you wish. Accenting elements, creating focal points or simply making a bold statement, these dimmable and switch-operated films are indistinguishable from traditional wall coverings when in the off position. Switch it on and the embedded OLED coating will glow softly to add an atmospheric element to both commercial or domestic environments. When combined with motion sensors, there is even the opportunity to mediate user-interaction where a person passing causes the light to animate.

Aside from decorative and stylistic possibilities, other chemical coating technologies are being developed that imitate natural light in low-lit or windowless environments. The product acts like painted light and when applied all over the walls, a very slight glow can be generated throughout to mimic sunlight. Such possibilities go beyond decoration and can actually help to enhance your mood and energy. This lighting solution changes light as we know it while consuming very little power and being fairly low in cost.

The ceiling of a room is often neglected – this laser-cut structure made of a textile or a foil creates a distinct atmosphere and conceals unsightly equipment.

The Ceiling, Hägersten, Sweden; Boel Andersson

Bus stop: the wall installation made of laser-cut three-dimensional MDF lettering acts as an eye-catching display showing the stops connected by the public transport network.

KWS Kraftverkehr Wupper-Sieg Customer Centre, Leverkusen, Germany; 100% interior Sylvia Leydecker
Rippling waves: the textile ceiling design of this hotel lobby echoes the view of the sea. Gentle waves, moved by the wind, are a never-ending poetic means of transposing the movement of nature to the interior.

Hilton lobby, Pattaya, Thailand; Department of ARCHITECTURE Co. Ltd.

Triangular: the space is defined by the strong geometric graphical pattern of triangles.

Arthouse Café, Hangzhou, China; Joey Ho Design Ltd.
Hanging undulating ceiling elements made of LEDs and metal wire are digitally controlled and unite light and sound in a unique way.

Aura Light and Sound Suites – Nightclub, New York City, New York, USA; bluarch

Light instead of lighting: the futuristic appearance of this hotel room is reinforced by the illumination that is integrated into the shape of the room.

Future Hotel Showcase, Duisburg, Germany; LAVA – Laboratory for Visionary Architecture
Moiré – interactive light forms
graphical wavy structures.
OLED installation by Philips Lighting,
Langenthal, Switzerland

OLEDs will in future
be an indispensable light source and will soon replace the use of LEDs – as interactive and normal light sources.
Post Digital Philips Lighting, Milan, Italy;
Studio Fabio Novembre
Translucent back-lit concrete – achieved using light-conducting fibres – is particularly fascinating for the small patients attending this dentist’s practice.
LIGHT CONCRETE

Experimental approaches to material development have also led to some other unusual and surprising concepts, none more so than translucent concrete. With the strength and appearance of traditional concrete at first sight, this material is indistinguishable until placed next to a light source where suddenly shapes appear through from the other side as shadows, almost like on a sheet of fabric. This mystical effect is not as high-tech as it first appears and is actually the result of a combination of just two materials from very diverse beginnings and backgrounds. Very tiny optical fibres are placed in a regular pattern throughout a very fine concrete matrix. Quite simply the fibre optics allow light to pass through from both sides and so give the appearance of translucency.

With the ability to induce an almost child-like wonder, the material invites you to interact with it and contemplate its illusive nature. By fusing a material so mundane and ubiquitous as concrete with something as high-tech as fibre optics, each material has been given a new lease of life as a new material altogether. The juxtaposition of strength and lightness, the mundane and magical, industrial and chic is poetry in physical form. Channeling urban industrial features with something so delicate and whimsical, the two personas compliment one another beautifully to create what you might classify as “ethereal industrial”.

This extraordinary material would particularly lend itself to a partition wall between an outside space and the indoors. It would also be particularly effective in commercial environments from shopping malls to nightclubs where there is a great deal of movement and opportunity for interaction. It creates an enchanting environment that is both ethereal and tough.

Reclaiming a Yarn

While materials can be revived and transformed by combining them with a modern technology, they can be given a new lease of life simply through introducing new manufacturing and production methods. For instance, a very conventional and traditional material like ceramic can be rejuvenated through experimentation in form.

As one of man’s oldest materials, ceramics have over recent years gone through an expansion and modernisation phase. For instance, ceramic fabrics contradict any perception that we have of this brittle and hard material. They are made by spinning very thin strands of ceramic into a yarn and weaving them together to create a fabric that is surprisingly strong and has an incredible resistance to heat. This innovation has been put to use in some of the most demanding and challenging applications, from deflecting heat from jet engines, to military armour where other materials were unable to cope. These new applications have inspired other, more subtle and humble developments in the modernisation of ceramics for use within the home and interiors.

In the same way that ceramic can be given a new lease of life through experimentation in production methods or form, so can processing methods be redefined when used in conjunction with experimental materials.

RECLAMATION

Taking an economical approach to material selection and forming it using a traditional processing technique, we can transform the way we perceive waste or recycled materials. The idea of using plants to produce materials is nothing new, but taking seemingly useless elements of these plants, for instance coconut shells from the food industry, and combining them with the weaving technique is recontextualising the material and turning it into a functional and decorative surface. Panels and tiles can be woven from these reclaimed coconut shells that are left over once their edible content is removed and then combined with other natural resins and backings. They can be woven into various structures and patterns and dyed in a range of natural tones to add an exotic and rustic touch to any ceiling surface. The ensuing unique tactile and textured surface would compliment and contrast with the smooth finish of the walls to help bring a little of the natural outdoors in.
Space illumination: this installation unites a projection, graphics, light and sound to an aesthetic whole.

BBASS installation, Ghent, Belgium; SAQ Architects
Light, air and acoustics – are these design elements? Although often perceived merely as a functional necessity, the integration of technical installations, the aesthetic potential of which is not immediately apparent, offers fascinating design possibilities. The design of light, air and acoustics can help shape the direction, zoning and layering of a space, and can significantly influence its atmosphere and impression.

The breadth of design possibilities offered by these three “building materials” is diverse. In this respect, it is important to utilise the design potential of all elements that enclose and define space, whether furniture, walls, floor or ceiling. The ceiling in particular is a surface whose design potential is often overlooked. Typically serving just a functional purpose, the design of the ceiling should be seen as an opportunity to shape the identity of a space. Very often it is the only surface that cannot be concealed and as such has the potential to significantly influence the aesthetic impact of a space. An innovatively designed ceiling can tell stories, awaken desires, dreams and longing or alternatively be calming. It activates cultural or personal memories and consequently plays a key role in helping people identify with a space.

LIGHT – A SENSUAL BUILDING MATERIAL

Over and above its functional purpose, light is one of the most sensual design elements in the palette of technical installations. In all its dimensions, it is not only an aesthetic but also a dynamic building material, capable of lending spaces structure, shape and identity – as well as a distinctive atmosphere.

The visual appearance, experience and form of spaces can be influenced through the use of artificial and natural light. A good lighting design concept is a product of an intensive study of the spatial context. It creates backgrounds, defines visual axes, establishes relationships, highlights elements and helps direct how we perceive the hierarchy of a space. Light is essential to our perception of space. To fully exploit the great potential of light, it is important to understand the effects of the different qualities of light.
Into the dark: as part of the Trailerpark Festival, the night was illuminated with an interactive starry sky of light and sound.

Black Box Revelation, Copenhagen, Denmark; Re-Make/Re-Model Architecture
Meow: lighting scheme for an out-of-the-ordinary veterinary surgeon’s practice.
Veterinary Clinic for Small Animals, Lübeck, Germany; Monz + Monz | Innenarchitektur und Design

Lines: strips of concealed lighting subtly demarcate the contours of the space.
Office interior for the ICADE Premier Haus, Munich, Germany; landau + kindelbacher
QUALITIES OF LIGHT: FROM RICHARD KELLY TO THE PRESENT DAY

Richard Kelly, one of the pioneers of modern lighting design and architectural illumination, who worked with Louis Kahn on the Kimbell Art Museum and with Ludwig Mies van der Rohe on the Seagram Building, used different qualities of lighting to give elements in space a particular meaning. His pioneering light compositions influenced several generations of lighting designers and architects and his elaborations on architectural illumination, although now half a century old, remain as valid as ever. His lighting concepts visualise emotions, but relate these emotions to a particular function. As a consequence, light does more than just create a comfortable environment; it also provides orientation. For his lighting concepts, Kelly always started from the viewpoint of the user. He united psychological findings with his experience of stage lighting. The theatrical style of his lighting concepts results in spaces that are not only aesthetic but also have depth and meaning.

Richard Kelly grouped light into three basic types: “ambient luminescence”, “focal glow” and “play of brilliants”. The use of these three basic types defines the character of a space and creates spatial complexity. Targeted lighting is used to accentuate the specific characteristic of a space and creates and communicates information about the space and its structure.

“Ambient luminescence” forms the basis of the lighting concept. Here diffuse light is used to assist orientation by uniformly and evenly illuminating the room, including all its elements and objects, without throwing shadows. The meanings, relative sizes and forms are not important. Instead the light focuses on the room itself and its geometric dimensions. It creates a spatial sense of security.

In the next step, “focal glow” is used to create a second level of thematic accents in the space, providing the viewer with a more directed sense of orientation by separating the important from the unimportant. This glow lends conceptually relevant elements in the space importance by giving them different levels of brightness, directing the viewer’s attention and creating focal points. Like a theatre spotlight, it orders and accentuates our perception of space. A chain of meaning can be created through the use of several instances of “focal glow” within one space. The “focal glow” helps us perceive a space.

The “play of brilliants” places emotionally inspiring accents on particular details of the space. The magical light captures the viewer’s perception and creates brilliant highlights that help in experiencing the special quality of the space. These visual highlights deliver moments of vitality and an ambience with a clear thematic structure that is visually attractive, informative and interesting, as well as functionally logical in its structure. It is the dazzle that lights up our eyes by appealing to our senses.

These three functions of light can be combined individually with one another to create unique lighting concepts and spatial impressions. Using this palette of possibilities, the lighting designer can underline a particular facet of a space, or create a particular spatial experience, visually enhancing the overall impression of the interior’s architecture.

Today the use of light-emitting diodes (LEDs) has extended the breadth of design possibilities considerably by exploiting their key characteristics: cost-effectiveness and minimal requirements in terms of technical installations.

The reservations voiced in the early days of LED technology at the beginning of the 1990s have long been overcome. Initially only employed for very specific uses, LEDs are now used in almost all areas of architectural lighting and for artistic installations and more recently have become available on the mass market. The key benefits of LEDs are their long life and efficient energy requirements. Due to their extremely small size, they can be used in all manner of situations and, unlike other light sources, LEDs do not produce UV or IR light. Consequently light-emitting diodes will not cause works of art or goods in stores to fade or discolour. LEDs are energy-efficient and can produce a remarkably bright light with low energy loss and little heat.

In architectural lighting compositions, LEDs offer design advantages unachievable with other light sources. Light-emitting diodes can be used to create interesting visual effects over large surfaces, bringing them to life. They require very little space, allowing them to be used on almost all kinds of surfaces, substrates and geometric forms, which gives architects unprecedented freedom in designing architectural lighting concepts.
Using LEDs, video installations or screens can be used not just to illuminate spaces or produce lighting effects, but also to create complex three-dimensional spatial theatre. LEDs make it possible to create pulsating, dynamic spatial constellations that play with the colour and intensity of light. By equipping them with sensors, they can be used to dramatic effect to visualise the movement of people passing by, creating a direct interaction between people and space. Surfaces can be made to come alive, to respond dynamically and to communicate content in three dimensions. The use of LED technology therefore opens up new interesting possibilities for perceiving and portraying space.

Intelligent systems are able to control individual LEDs to modulate the desired atmosphere, colour or warmth of a space dynamically. Any conceivable content, any kind of abstract graphic information can be presented visually. LEDs that present graphic information, or alternatively video content and films, serve equally to help shape the space, to communicate content and to provide orientation.

Dreamland: a skilfully illuminated bedroom creates a luxurious atmosphere.
Numptia Super Yacht; Achille Salvagni Architetti

Drama: the focused use of light creates an appropriate atmosphere for a theatrical experience – in this case a restaurant interior.
Viet Hoa Mess Restaurant, London, England; Vonsung
By definition, information technology pervades all areas of life within an information society. This is the type of society most of us live in. As a consequence, information technology is bound to have a major impact on our daily lives, an impact manifest to a great extent in the design of interior spaces. The integration of media and technology demands a close coordination of architects, interior designers, home automation engineers, media experts and craftsmen. With technology and media being integrated more and more into interior spaces, furniture, everyday objects, devices and materials, a deeper look into the impact of information technology from the interior designer’s perspective seems essential.

The information society “is a society where the creation, distribution, diffusion, use, integration and manipulation of information is a significant economic, political, and cultural activity. The aim of the information society is to gain competitive advantage internationally, through using Information Technology in a creative and productive way.”1 Information technology is not only the Internet. Instead, it is a superordinate concept for the processing of information and the hardware and software required for this. Contemporary and future human-computer interfaces (HCI) need further detailed consideration within this field as well.
The information society started somewhere between the 1970s and today and is changing fundamentally the way societies work. Within the last three decades, information technology has transformed many areas of our lives by changing the way we use digital media and interact with our environment in almost any given context. As an example, automotive interiors have changed completely over the last 30 years in terms of the user’s possibilities to interact. While cars in the 1970s were merely equipped with physical interfaces for very basic functionalities, vehicles today are moving supercomputers where the driver is surrounded by an overwhelming set of controls including tangible interfaces, voice control and touch-sensitive interaction, to be used in parallel in multimodal interaction. What is more, the automobile today not only inter-operates with personal devices like mobile phones but also communicates with other cars and service operators, enabling for example much better traffic jam foresight and security.

One key driver of this change, obviously, is the continued miniaturisation and interconnectedness of technology, which now allows information technology to be integrated into everyday objects, fabrics and materials. Technology is moving away from single stationary devices that still make up our life today into a future where technology is ubiquitous and invisible – a permanently available virtual surrounding augmenting our physical environment. Highly integrated solutions like wearable computing are indicative of this trend. This vision of ubiquitous or pervasive computing is quite well understood by now and has become a large-scale research topic – being called “The Internet of Things”. Ubiquitous computing refers to “invisible, everywhere computing that does not live on a personal device of any sort, but is in the woodwork everywhere”.2 Mark Weiser, a computer scientist and researcher at Palo Alto Research Center, predicted this (r)evolution 25 years ago by stating: “In the 21st century the technology revolution will move into the everyday, the small and the invisible.”3

So, nothing new? What is rather new is that we are witnessing this utopia actually turning into reality. Many people see this upcoming reality as a threat to some extent – or at least they ask the question whether we really need this amount of “comfort”. Do we need coffee cups that show us the exact temperature of the liquids they contain or seating furniture that charges our mobile phones? Obviously, new technologies arise because we are capable of inventing them, not because we need them. The question is: what makes sense? That is where designers come into play. Their role is to use given technologies in a reasonable manner to fulfil existing user needs. As Klaus Krippendorff puts it: “The etymology of design goes back to the latin ‘de’ + ‘signare’ and means making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners, users, or gods. Based on this original meaning, one could say: Design is making sense (to things).”4

Especially for the interior design discipline, information technology opens up undreamt-of possibilities. Technology can enhance our daily lives by increasing quality, adding comfort, security and efficiency while reducing maintenance time, costs and environmental pollution. But it all comes down to the user – the inhabitant – at the end. Technological systems get more and more complex, while their usability needs to get more and more simple for people to adopt them. This platitude is a logical side effect of the information society: people are overloaded with the amount and diversity of information and technology. As technology is also no longer transparent and comprehensible for end users, they need efficient and properly working solutions as they are no longer capable of repairing things. What is needed is comfort based on technology and made available by design.
SMART HOME

The interior design discipline currently faces the challenge to combine the physical and the virtual environment. Interior designers of today and especially of tomorrow need to cope with complex technological opportunities and fulfil central cross-linking design tasks in interdisciplinary teams to evolve and apply sense to rich user experiences in domestic, public and work environments.

Within the last years, terms like Smart Home or Connected Home became more and more popular. Smart Home solutions or Home Automation systems aim to simplify living at home and offer more quality of life, comfort and security. Multiple areas of applications exist. It is appropriate to distinguish the subsectors Home Entertainment, Energy Management and Household Controls. Home Entertainment addresses the users’ need for all kind of media at home, available in multiple devices and in multiple locations. Energy Management concerns sustainability issues, ecological and economic aspects: heating, ventilation, air-conditioning, power consumption and so on. Household Controls contains all kinds of applications around the building: security systems, light control, assisted living, etc. This categorisation already indicates the major issue: the need for standardisation.

As often, North America is the biggest market worldwide, with most suppliers and the most technically mature solutions. In Europe, and especially Germany, holistic Smart Home systems have not yet reached the mass market as the back-fitting into existing buildings is mostly considered to be too complicated. In Europe, currently only 20 % of Smart Home solutions are installed in existing buildings, as 80 % are installed into new buildings. Asian players mostly act as suppliers for Western companies, with only few European and American brands on the market. In this field, China will not belong to the key markets in the close future, which is also due to cultural differences, as for example Americans feel a much stronger need for security systems than Europeans or Asians, while in Asia, wireless solutions are preferred over wired ones.

The Smart Home market is constantly growing and changing as user needs for comfort and connected solutions at home increase. Being dominated by premium solutions before, many young innovative companies are entering the mass market and the do-it-yourself (DIY) market, offering simple “wireless plug & play”-products.

While various players are pushing into the market, Smart Home is a complex story, especially for users. As always, the pitfall is within standardisation. Currently, technological aspects of standardisation drive the Smart Home discussion, but the next real challenge is within the area of user experience – providing simple and enjoyable user interfaces across multiple devices.
STANDARDISATION AND THE USER EXPERIENCE

From a technological perspective, “central intelligence” is the most promising approach: A “digital butler” has the knowledge about the devices and the different communication channels inside the house. “He” manages to connect different devices with different networks, supporting device-independent solutions. In principle, the exchange of one device will not change anything from the users’ perspective. Systems are being developed in various countries on a national scope; in Germany, for instance, a partner network recently developed a technological standard called SerCho – a software-based module toolbox to integrate devices into a manufacturer-independent network.

Obviously, the hardware device that connects all the other devices inside a building with the outside world (currently known as “the Router” and “the Internet”) has the potential to fulfil this task as well. A leading networking hardware provider, Cisco recently released CloudConnect, a service that gives users “anytime, anywhere access to their home network” as a basis for further connected living scenarios.

There will be no universal, international standard for Smart Home solutions in the near future. Therefore, from a user perspective, the most important factor is device interoperability and usability. Large technology companies that offer a wide range of consumer devices for the digital lifestyle tend to create “closed” eco-systems wherein their devices interoperate very well while “foreign” devices are excluded. Such closed eco-systems of single suppliers in the Smart Home subsector will almost certainly become obsolete and replaced by open platforms for multiple devices, creating eco-systems to connect people, devices, their homes and cars in seamless, “ubiquitous” scenarios.

Fall detection: floor surfaces equipped with sensors and digital communication are able to help ensure the safety of elderly residents by registering and reporting falls.
SensFloor; Future-Shape GmbH
RESIDENTIAL APPLICATIONS

Residential buildings feature more and more information technology, making them complex “devices” with immense capabilities. According to Tom Rodden and Steve Benford,11 “new challenges can be identified that will need to be addressed by those involved in designing them”. In 2003, Rodden and Benford identified three different categories for appliances for ubiquitous domestic environments: Information Appliances, Interactive Household Objects and Augmented Furniture; a useful segmentation that seems still valid almost ten years later: “Information Appliances are stand-alone interactive devices that are self-contained with specific functionality”12.

Many of these have been realized in the home by layering interactive functions onto existing household appliances using standardized communication facilities. Examples of these include the Internet fridge13 and handheld and mobile devices14 supporting specific forms of interaction. Interactive Household Objects merge interactive capabilities with existing household objects to offer new forms of interaction. These often build upon the cultural values associated with existing artifacts. Examples of these include augmenting picture frames with new display and interaction facilities,15 adding new communication capabilities to household notice boards16 and augmenting cups.17 Augmented Furniture adds interactive capabilities to the different furniture in the home. These include the DiamondTouch interactive table18 and proposals to augment cupboards19 and garden furniture.20 These three different approaches vary in terms of the prominence of the digital technology and the ways in which the technology is made available to inhabitants. The technology is most intrusive in information appliances and then reduces in household objects and augmented furniture.”21

Most of these six layers demand specialists like architects, civil engineers, service providers, designers, craftsmen or other experts to be built and maintained. Although information technology has developed much further since the early 1980s, Brand then already understood that the different levels are closely interwoven and that devices within the Stuff layer are closely tied to the underlying Space Plan layer. Unsurprisingly, interior design focuses on issues surrounding Space Plan and Stuff, leaving out the Service layer. Even more interestingly, the Service layer is the one to correspond to the notable changes by the emerging integration of information technology in terms of interoperability and connectedness.

To evolve compelling user experiences in ubiquitous domestic environments, the interior design needs to incorporate all three layers: Service, Space Plan and Stuff. The Service defines the core technological capabilities and acts as the foundation, whereas the Space Plan incorporates a flexible infrastructure for the Stuff to work properly, while allowing inhabitants to adapt in accordance to their individual needs.

Compared to devices and cars, domestic environments feature one major difference: they evolve over time according to user needs. Residential homes are open to continuous change. The ever-changing nature of buildings is the subject of the framework presented by Stewart Brand, which adds an interesting perspective to the design process. According to Brand, the core concept to understand how buildings change consists of six layers – the generic “six S’s”: Site, Structure, Skin, Services, Space Plan and Stuff.

Site, in this context, means the “geographical setting, location, and the legally defined lot, whose boundaries and context outlast generations of ephemeral buildings”. Obviously the site is fixed and does not change easily. Structure refers to the “foundation and load-bearing elements which are perilous and expensive to change, so people don’t. These ‘are’ the building. Structural life ranges from 30 to 300 years.” Skin describes “the exterior surfaces” that “now change every 20 years or so, to keep up with fashion, technology, or for repair”. Services are the “work-
PUBLIC AND COMMERCIAL ENVIRONMENTS

Unlike residential environments, public and commercial environments form a much broader field of applications, but the general considerations concerning the integration of information technology remain the same.

Within commercial spaces, especially corporate environments, retail spaces and industrial facilities can be distinguished. While corporate offices, training and manufacturing facilities, big retail facilities, shopping malls and department stores mainly demand large-scale standardised solutions for collaboration, marketing and communication, there is a high potential for individual innovative solutions in “spatial branding” – venues that make use of space as a medium to express the corporate brand. What is often developed for flagship stores, showrooms or single-brand stores most certainly can and will be applied to all kinds of corporate environments and therefore should be of high interest to “digital native” interior designers. These venues demand the brand values to be communicated in a holistic manner to raise the users’ involvement. Here, innovative technology allows to stand out against the standard audio-visual media that people probably have seen before. This applies also to exhibition and event design for non-permanent spaces as well as institutional venues like museums.

Public environments share another distinct specificity: the user need for personalised services. This applies to healthcare environments (for example, hospitals, assisted living facilities and medical offices using electronic health records and telemedicine appliances) and also to hospitality and recreation facilities (hotels, resorts, cafés and bars, restaurants, health clubs and spas offering designated services, etc.). Even though they offer a different kind of service, this also applies to institutional venues like government offices, financial institutions, schools and universities, museums and congress venues.

The pitfall for seamless scenarios in public environments is that we do have multiple virtual identities that we share extensively, but we do not like to broadcast our real one, which means that interaction in public environments demands a standardised, safe and reliable authorisation method beyond what we call “Login” today.

Public venues and commercial spaces differ from residential buildings in a few simple yet challenging key issues:

1. Users have little or no control over the infrastructure. Those who set the requirements are not those who use the spaces, making it more difficult to define the actual needs and leading to more standardised solutions.

2. Privacy needs are different. Technology can be used in a personalised and an unpersonalised manner. In public spaces the relation of single-user scenarios versus multi-user scenarios is reversed compared to residential environments. This means that public spaces need further examination to cope with both private and public use scenarios, including issues of the integration of technology.

3. Instead of inhabitants, there are multiple user groups with multiple needs. Employees, customers, patients, visitors and foreigners have different user needs, hence the scenarios of use differ in terms of involvement, authorisation, service offers and information. Consider, for example, the user needs of medical staff, patients and visitors in a hospital in relation to a family in its home.

4. While the fields of application are identical, the focus differs according to the type of environment. The bigger the venues are, the higher is the need for building automation, energy saving, security and communication technology. By contrast, entertainment plays a subordinated role.

5. Last but not least, the interfaces are potentially more numerous than in residential buildings. Being the core topic for designers, interfaces can be both humans and technology here. In public and commercial environments, designers need to deal with more stakeholders and more technological interfaces in parallel.
In this book I wanted to reveal the complexity and sophistication of interior design. It was not our intention to create another coffee table book or a technical manual. Instead, the conceptual idea for this internationally oriented publication on interior design is based on two main components: contributions from a careful selection of professional authors and examples of interior design from around the world. Rather than showing individual projects in the form of case studies, the book features compilations of projects that highlight and illustrate specific themes.

The field of interior design is becoming both ever more complex and ever more specialised. But despite the increasingly varied and less uniform structure of the field, the activities of those practising in it still relate to “interiors” as a whole. This can be seen in the range of different approaches and ways of conveying the information that the authors take, coupled with their willingness to work within the systematic framework of the structure of this book, ranging from education and design inspiration to international practising in the field. Deciding which projects to choose to illustrate the topics was a seemingly endless task, as new, interesting and exciting projects are continually surfacing all over the world, making the selection even harder. In the end, we elected to set a cut-off point, which in this case is 2012. The result is a book with two parallel layers, one of texts, the other of images, that are distinct from one another but at the same time complement each other.

The authors I chose first and foremost for their professional competence and also my personal knowledge of them. I would like to extend my heartfelt thanks to them all, for their contributions but also for staying the course over the protracted and at times uncertain development of this publication. The same goes for my editor Andreas Müller, who at all times held the reins firmly but calmly, and contributed (yet again) with helpful and competent suggestions to the success of this book. Those who created the projects shown and/or made images of them provided us with a wealth of material, and they are to be thanked for making it possible for us to present such a rich and varied selection of projects to illustrate the topics.

While personal relationships, trustworthy partnerships and functioning networks in the real world still remain as valuable as ever in the digital age, advances in information technology did help to make the entire project much easier to manage. Whereas in 2008, when working on my previous book, I received large quantities of data on CD by post, this time the contributors and participants busily uploaded and transferred data online. One should nevertheless not forget that there are colleagues in countries whose virtual boundaries are tightly controlled and for whom communicating online is practically impossible. The task of sorting, structuring and selecting projects was, of course, that much more difficult because we had requested and received much more material than we were able to use. This is where I would like to thank my own office crew, including Sabrina Wolters, Nina Kröncke, Rena van den Berg and especially Florian Kast, who were entrusted with handling the project, experienced various ups and downs, and also relieved me of much work.

Managing and writing a book project “on the side” while also working as a practising interior designer and running an office means you need to be well organised and to enjoy doing this. Where global processes are concerned, a degree of openness also helps – the exchange of cultures has, after all, as much to offer in the realm of interior design as it does in other fields. But not only the authors and projects are international; the book itself is an international coproduction by my esteemed editor Andreas Müller in Berlin, the delightfully British translator of the German texts, Julian Reisenberger in Weimar, and the magnificent Austrian graphic designer Rein Steger in Barcelona – where we had a most enjoyable meeting over glasses of Cava discussing the final layout of the book. Thank you all for your work on the book.

Finally, I would like to extend special thanks to the sponsors for making this book possible in the breadth and depth that we have achieved.

It is my hope that this book does justice to the complexity of the profession, that it inspires readers to reflect on and explore the subject in greater detail and, last but not least, that it encourages people to work together with professional interior architects and designers.

I would like to end with the words of Robert Smith, front man and leader of The Cure, who said (taking the words right out of my mouth): “I do a job I really, really love and I kind of have fun with. People think you can’t be grown up unless you’re moaning about your job.”

Sylvia Leydecker
Spa / Cologne in January 2013
ABOUT THE EDITOR AND THE AUTHORS

SYLVIA LEYYDECKER (Dipl.-Ing.) is a practising interior architect and runs the studio 100% Interior in Cologne, Germany. She studied interior design at the Wiesbaden University of Applied Sciences and Trisakti University in Jakarta, Indonesia, graduating from Wiesbaden in 1996. Before setting up her studio as an interior architect, she gained many years’ experience working internationally for Lufthansa, including extended periods spent abroad in Manchester, UK, and Paris, France. Today her office designs corporate interiors with special focus on interiors for healthcare environments as well as the design of offices and products. She is volun-
tary Vice-President of the Union of German Interior Architects/ Designers (BDIA) and is a delegate of the International Federation of Interior Architects (IFI). She is also a member of the German Designer Club (DDC) and the Hospital and Healthcare Design Committee (AKG) of the Association of German Architects (BDA). First and foremost, she is a passionate inte-
rior architect, designer and author of numerous publications. Sylvia Leydecker has established an international reputation as an expert on the application of nano-materials in the built envi-

MARK BLASCHITZ, born in 1965 in Graz, Austria, co-founded the SPLITTERWERK Label for Fine Arts in 1988, whose work has won numerous awards and been featured in several renowned exhibitions, including the Biennales in Venice and São Paulo and the documenta in Kassel. Mark Blaschitz studied architecture, philosophy and sociology, graduating from the Graz University of Technology in architecture and urban design. He has lectured since 1989 on architecture, urban design, art and design and was Visiting Professor for space&designstrategies at the Linz University of Art and Design in 2009 together with her&siblings, before being appointed to Full Professor at the Stuttgart State Academy of Art and Design (ABK). In 2010 he became Director of the Chair of Housing, Fundamen-
tals and Design at the ABK Stuttgart and was a Visiting Professor at the Centro de Estudios Superiores de Diseño de Monterrey (CEDIM) in Mexico in 2012. In 2012 he became Dean of the Faculty of Architecture at the ABK Stuttgart.

MICHAEL CATOIR, born in 1966 in Essen, Germany, is an industrial designer. Following an appren-
ticeship as a carpenter, he studied industrial design at the Folkwang University of the Arts in Essen. After two years of collaboration with André Putman in Paris, France, he was head of the Interior Design and Styling Department at the studio of Matteo Thun & Partners, Milan, Italy, from 2000–2008. Since 2008 he runs, together with his wife Elisa, the Studio Catoir in Milan and Paris, carrying out projects for interna-
tional clients in the field of interior design, product design and graph-
ics. With a focus on residential and hotel projects, Studio Catoir provides design services across the full spectrum from objects to interiors and facade design, as well as corporate identity.

JOANNE CYs is Associate Profes-
sor of Interior Architecture and Dean: Teaching and Learning in the Division of Education, Arts and Social Sciences at the University of South Australia (UniSA). She has also held positions as acting Dean of Research and acting Dean of Graduate Studies at UniSA. Joanne Cys is a Life Fellow of the Design Institute of Australia and was its National President from 2009–2010. She is an executive board member (2011–2013) of the International Federation of Interior Architects/Designers (IFI) and is co-chair of IFI’s Global Interiors Education Open Forum (GIEOF). Joanne Cys is Australia’s repre-
sentative to the Global Design Network (GDN) and the Asia Pacific Space Designers Alliance (APSDA). She is a founder of the Australian Interior Design Awards program and has been the jury convener of the program since its inception in 2004. She has been invited to speak at international and national conferences on design exhibitions and is regularly invited to write for professional design journals. She has published over 50 academic papers in schol-
arily journals, conference proceed-
ings and chapters in edited books.

LARS GRAU is a designer and educator focusing on interactive technologies. He is Professor of Media and Communication Design at the Macromedia University for Media and Communication (MHMK) in Hamburg, Germany, and runs the user experience design agency MOKiK in Berlin. He has worked since 1999 on the development of holistic user experience con-
cepts for mobile applications, web applications, digital television and spatial interaction. His spe-
cial field lies in the integration of strategy, design and technology and research into embeded inter-
action. He is a regular speaker at events and a jury member of the annual DDC Design Prize.

SIMON HAMILTON, London-
born with an interior design degree from Nottingham, UK,
has established himself as an interior designer with a career spanning over 20 years in the fashion industry. Running his own interior design consultancy, Simon Hamilton & Associates in London since 2002, he has provided opportunities to design for a wide variety of projects across workplace, residential, retail and hospitality sectors in the UK and abroad. In his position as International Director for The British Institute of Interior Design (BIID), he is an ambassador for the best of British design, networking at high level on a global scale.

PETER IPPOLITO studied architecture in Stuttgart, Germany and Chicago, USA. During his studies he worked as an assistant to Professor Ben Nicholson in Chicago and gained practical experience in the office of Daniel Libeskind in Berlin, Germany. In 1999 he co-founded ZipperSpaceworks, which in 2002 became the Ippolito Fleitz Group, run together with Gunter Fleitz.

Peter Ippolito was a Visiting Professor at the Stuttgart Academy of Art and Design (2001-2002) and taught from 2004-2008 at the University of Stuttgart and in 2009 at the Biberach University of Applied Sciences. He has served in numerous competition juries and is regularly invited to speak at conferences.

CHRIS LEFTERI was born in London, UK, and studied industrial design at Central Saint Martins College of Art and Design, completing his MA under Professor Daniel Well at the Royal College of Art, London. He is recognised throughout the world as an authority on materials and their application in design. For over a decade his studio work and publications have been pivotal in changing the way designers and the materials industry consider materials. In 2001 he published the first of eight books on materials and their application in design ("Materials for Inspirational Design" series, RotoVision, UK, 2001–2007), which have been translated into six languages. Subsequently his studio, Chris Lefteri Design, has worked with bluechip corporations and major design studios across Europe, the USA and Asia, implementing a broad range of strategies for effective materials integration in the design process.

KEES SPANJERS is an interior architect and architect and lives and works in Amsterdam and New York. He is the Director of Zaazen Spanjers Architects in Amsterdam, The Netherlands, specialising in cultural buildings and public interiors, and the recipient of numerous awards, including the Architectural Record Interior Awards. Kees Spanjers was the President of the European Council of Interior Architects (ECIA) and served as co-opted board member of the International Federation of Interior Architects / Designers (IFI). He is a past President and now honorary member of the Dutch Association of Interior Architects (BNI). He has written many professional articles and has been active on many international panels and juries.

JOHANNES STUMPF, born in 1963, lives and works in Berlin, Germany, as a freelance architect. His office, Büro Stumpf, specialises in the management of complex building projects, both for new buildings and conservation projects, and acts as an international consultant for institutions and enterprises on issues of sustainability in building construction. In 2007, he became Vice-Chairman of the Regional Competition Committee of the Berlin Chamber of Architects, where he is instrumental in the ongoing development of competition and tendering procedures. Since 2008, he contributes as part of an international development cooperative to the establishment of training concepts for local energy-use auditors in countries such as Romania and Georgia. In his capacity as an author, he also writes for a number of German architecture magazines and journals.

DR. MARINA-ELENA WACHS, born in 1966, is a qualified industrial designer, dressmaker and pattern cutter, and works as a design consultant for companies and architects, and as an author, curator and educator at universities and academies of art and design. In her doctorate (2003–2007, Braunschweig University of Art), she undertook interdisciplinary research into the use of new materials in design, art and architecture, culminating in the publication of her book Material Mind (Dr. Kovac Verlag, Hamburg, 2008). In 2010 she was appointed Professor of Theory of Design at the Niederhine University of Applied Sciences. She has worked with architects, lighting designers and designers in the field of lighting and furniture design and contributes actively to professional federations and associations such as the German Fashion Institute (DMI), the network fashion textile (nmt), the German Society for Design Theory and Research (DGTF) and the British Design History Society. She lectures and publishes widely, most recently in the book Nachhaltiges Textiles Design / Sustainable Textile Design (Schaff-Verlag, Hamburg, 2013).

DR. THOMAS WELTER, born in 1969, is Managing Director of the Association of German Architects (BDA). He studied economics and North American studies at the Free University of Berlin, worked freelance for the German Institute for Economic Research (DIW) in Berlin and taught at various educational institutions. After completing his doctorate in economic sciences (Dr. rer. pol.) in 2000, he joined the Federal Chamber of German Architects (BAK) as Head of Economic Affairs, becoming Managing Director of D.A.V.I.D., the association’s publishing wing in 2002 where he was responsible for the Network for Architecture Exchange (NAX). He lectures widely, chairs discussions and contributes to numerous publications.

LILIANE WONG, born in Hong Kong, China, is Professor and Head of the Department of Interior Architecture at the Rhode Island School of Design, where she has taught since 1998. She earned her MA in architecture from the Harvard University Graduate School of Design and her BA in mathematics from Vassar College. She is a registered architect in Massachusetts, USA, and has practised in the Boston area including in her firm, MWA, where she focuses on the design of libraries. She is a co-designer of the library furniture system Kore. A long-time volunteer at soup kitchens, her teaching emphasises the importance of public engagement in architecture and design. She is a co-founder and co-editor of the Int|AR Journal, which promotes creative and academic explorations of sustainable environments through exemplary works of reuse.

I find all books too long.

Voltaire
The design of interiors, alongside the other design disciplines, is a vital task in the shaping of our built environment. In this book, an international and interdisciplinary team of authors gives an extensive account of today's main areas of work in interior architecture and design. Illustrations of contemporary projects, selected consistently throughout the book, cover the breadth of typical interior design tasks as well as a wide range of possible design approaches. This book is a fundamental reference work for all those professionally involved in the design of interiors.