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Bang & Olufsen: Design Driven Innovation[1]

"The Farm," Bang & Olufsen's futuristic glass-and-concrete headquarters, rose out of the green fields of western Denmark "like something lifted from a Stanley Kubrick dreamscape."[2] In a nearby parking area, Christopher Sorensen stepped from his car and walked toward the entrance, on his way to meet with a high-powered group that included the CEO, to discuss an important product program. Within this 80-year-old company, based in rural Jutland where local people might still consider you an outsider after 30 years, Sorensen would be very much the newcomer. Despite that, he would try to convince the others to adjust the firm's successful design process—to change a winning game.

In April 2006, Bang & Olufsen (B&O) sold a range of televisions, audio systems, loudspeakers, telephones, and other products (see **Exhibit 1**) in more than 60 countries. The company had a worldwide reputation for idea-based products of high quality and artistic design, many of which held places of honor in the permanent collections of the world's greatest art museums. (According to a citation at the Museum of Modern Art in New York, B&O had "delivered the largest and most consistent design portfolio among the world's industrial companies."[3]) This level of accomplishment translated into high price points (see **Exhibit 2**) and profit margins, realized through an exclusive network of dealers, from devoted and discerning customers.

To create products with appearance and functionality that made them instantly recognizable, the company had evolved unique design and development processes. B&O gave designers free reign to create new products that would challenge engineers to find a way to manufacture them. New ideas, materials, and technologies made their way into B&O products only if designers put them there. Customers had proven their willingness to pay handsomely for this degree of design integrity.

Enthusiasts liked to observe that "you can watch a B&O TV for hours—and then you turn it on" as a tribute to the firm's design prowess. But in 2006 what happened after a product was turned on

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[1] The expression "design driven innovation" is adopted from work by Roberto Verganti. See Verganti, Roberto, "Design, meanings and radical innovation: a meta-model and a research agenda," working paper, Department of Management, Economics and Industrial Engineering, Politecnico di Milano, Italy, 2006.

[2] Ryan Underwood, "The Case for Fanaticism," *Fast Company*, Issue 101, December 2005, p. 84.

[3] *Bang & Olufsen: From Spark to Icon*, Struer, Denmark, 2005, p. 528.

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was getting more complicated. The Apple iPod, acclaimed by designers and closely integrated with the online iTunes music service, had illustrated that design in the B&O market space had to encompass more than physical form and function. In the future, the company envisioned that its products would extend ever more deeply into virtual space, where great design meant great software and network-based interaction with other products and services. Excellence in these areas required skills and ideas different from B&O's traditional expertise.

Sorensen, hired two years earlier from an American consulting firm, was responsible for addressing this issue. His organization, "Idealab," had begun experimenting with "supplementary innovation," a way of injecting new ideas into products from outside the traditional process. Some saw danger to B&O's reputation, and thus, to profit margins, in any move away from designers' near absolute control over products. Might this be the first step down a slippery slope toward undifferentiated products? Torben Ballegaard, the company's CEO, aware of both evolving product markets and the perils of tinkering with success, acknowledged that deciding the right amount of change was difficult: "It's like insulin in the human body; too little and you die, too much and you die."

For the new program that would be the subject of this meeting, Sorensen intended to propose supplementary processes that he believed would produce great new ideas. To some at the meeting, the world's very best designers, his proposals would inevitably seem audacious. He'd have to present them anyway—and trust that the world-class talent assembled around the table would, collectively, arrive at the best way to move B&O forward.

Background—History, Industry, Competition, and Customers[4]

Peter Bang and Svend Olufsen, young engineers in pursuit of the perfect radio, founded B&O in an attic in 1925, at first selling mostly to friends. After developing an "eliminator," which allowed their radio to receive power from a socket instead of batteries, they acquired start-up capital, moved into a factory in Struer, and began to sell radios in volume. Throughout the 1930s, B&O produced radio receivers, loudspeakers, amplifiers, gramophones, and sound equipment for filmmakers. During World War II, Nazi sympathizers destroyed the factory when B&O employees refused to work for German occupiers. B&O rebuilt right after the war, and by the 1950s had gained a reputation as "The Danish Quality Brand."

Toward the end of the 1960s, competition from Asian manufacturers forced many Danish and European manufacturers to close. B&O survived by allying itself with a group of architects and designers, by focusing on the ideas and design behind its products, and by emphasizing high quality. It developed its own design style, influenced by the Bauhaus and by a Scandinavian preference for clean lines. The company's Beosystem 1200, the world's first complete set of matching hi-fi components (introduced in 1969), was added to the permanent collection at New York's Museum of Modern Art (MOMA) in 1972.

The 1980s brought intensified Asian competition together with weak product demand. Although very careful about product details, B&O managers had not paid enough attention to the business. Said Ballegaard:

> From 1925 to the 1980s, B&O had been a champion in all sorts of aspects, except when it came to earning money. . . . It was still viewed more as a family crusade—a company carried by a dedicated staff to produce good radios for people—than as a commercial business. As the

[4] Material in this section is drawn from company documents and the Hoover's, Inc. website, www.hoovers.com, accessed May 29, 2006.

distribution became more inclined to display truckloads of Japanese products instead of awkward looking B&O products, things started to look very bad.

The company's difficulties mounted, resulting in a "near-death" experience in 1992. At a pivotal moment in firm history, Anders Knutsen, a company veteran of 25 years named CEO in 1991, formulated the "Break-Point 93" plan.[5] Aided by cash from B&O supplier Philips, who bought a 25% stake in the company, Knutsen laid off one quarter of B&O employees, cut non-core activities, revised product lines, and launched a new distribution strategy. The company would sell its products through exclusive B&O retail outlets staffed by skilled salespeople who could explain complex and subtle product features; no longer would B&O appear on shelves alongside mass market products. The plan worked. In 1995, the company bought back the stake from Philips and enjoyed growth in revenue and profit.

In 2001, Torben Ballegaard Sørensen, an executive vice president at Danish toymaker LEGO, took over from Knutsen. Under Ballegaard's stewardship the company revitalized its product development process, increasing product throughput and pace, and returning the company to acknowledged design *and* technological leadership. During this time, B&O also unveiled a new car stereo system developed with Audi, entered the mobile phone sector by collaborating with South Korean electronics giant Samsung on a product called "Serene," and launched initiatives aimed at the hotel industry and the luxury yachts business. In nonbranded business efforts, B&O developed, produced, and sold digital amplifier units, as well as products for the medical technology industry (such as tablet dispensers and insulin pens). B&O selectively licensed technology, developed to create its unique products, to companies in other industries.[6] In the 2004–05 financial year, the company achieved revenues of DKK 3.74 billion (approximately $600 million USD), up 4% from the previous year, and an operating profit of DKK 380 million (approximately $60 million USD), up 13%. (See **Exhibit 3** for selected company financials.) The U.K. and Denmark were B&O's largest markets, but 82% of the group's revenues derived from exports. Approximately 40% of revenues came from TV sales, and 25% from audio product sales.[7]

Two types of stores sold B&O products: So-called "B1" concept stores did most of the business. B1 concept stores sold only B&O products in high-rent locations and were owned mainly by independent dealers. Dealers owned their inventory, which was kept to a minimum by B&O's rapid fulfillment system. The company offered financing for new franchises but did not offer customer financing, except in some markets (e.g., U.K.) and for large business clients such as hotels. (Ballegaard stated, "We once ran an ad in Germany and Switzerland in which we used a leasing model; some of our customers were offended that we thought they weren't able to afford our products.") Keeping dealers healthy and vibrant was a top priority. Most other sales occurred via "shop-in-shop" (SIS) outlets. Individual dealers could sell B&O products if they set up a separate, significant section of the store according to B&O specifications. In 2005, the 685 B1 concept stores accounted for 72% of total revenue, while the 619 SIS outlets accounted for 28%. B&O planned to sell through these two types of retail outlets and increase their number, focusing on B1 concept stores and using SIS in areas where demographics did not yet justify a B1 concept outlet.

By 2006, B&O's 2,300 employees still developed and manufactured mainly home audio and video equipment. The B&O vision statement encouraged these employees to have the "Courage to

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[5] For more information on this plan, see Per Thygesen Poulsen, *Break-Point, Anders Knutsen and Bang & Olufsen* (Denmark: Centrum Jyllands-Postens Forlag, 1998).

[6] For example, Lamborghini's aluminum brake cables were anodised using B&O technology.

[7] "Cantos Q&A : Bang & Olufsen President, CEO Sorensen," Dow Jones International News, August 17, 2004, accessed via Factiva on May 22, 2006.

constantly question the ordinary in search of surprising, long lasting experiences" (see **Exhibit 4**). The company continued to launch products named the "world's best" by trade magazines.

Industry and Competition

Historically, consumer electronics had fared better against market saturation and economic downturns than other industries, mainly because technological advances and changing product lines created constant new demand. The success of digital TVs, DVD players, home theatre systems, cordless phones, and many other products showed that consumers liked to buy the latest gadgets. Large, well-resourced companies, such as Sony, Matsushita (owner of the Panasonic brand), Philips, and Thomson, competed for customers, as did industry outsiders with large marketing budgets such as Apple, Microsoft, Gateway or Dell.[8]

B&O considered itself the only brand that bridged the home electronics and lifestyle/luxury categories. Compared with bigger players, the company featured classic products with long life cycles sold in relatively small volumes, but at price points and margins that declined much more slowly than industry averages. Said Peter Eckhardt, head of B&O's product development:

> We see our competition more in the recreational car or home, high-end furniture, or luxury travel. Of course there are big players, like Sony. . . . But we relate more to a BMW than to the generic product ranges of electronics giants. We'd never be able to make any money in the mass market. Volume for us is when we get over 20,000 pieces of a product per year, something that Samsung produces before noon. We try to produce breakthrough products that are the farthest away from the reference in the market. And that are made to last.

This business model afforded protection from imitators. Ballegaard explained:

> In the traditional industry, only some small companies have tried to make products close to us, but they never became the real thing . . . when we discovered a whole fake B&O store in Beijing, it was full of products that had been imported illegally, not produced there . . . it would be too complicated and too expensive [to copy our products] as we are so unique in our materials (like aluminum and glass), and in our techniques.

Customers

Vital to the B&O business model was a set of core customers. In the U.S., for example, 800 to 1,000 customers accounted for 80% of revenues. Said Eckhardt: "They are the ones spending $250,000 for a complete B&O system setup (including TV, audio, and curtains and lighting adjusted from a remote control); the rest of the 10,000 customers there buy one phone." Ballegaard considered it his job to attend closely to customer relations:

> We trace the dialogue with the 2 million customers in our database through an advanced CRM system. Customer loyalty is high; 25% to 30% of our revenues come from existing customers. Many of them have followed us for years. People usually keep their B&O product for a long time and eventually buy more. Of course we must continue to live up to their expectations . . . brands are not made by marketing people but by the consistent delivery of a certain condition for many years. People who don't have a B&O always think it's just about design. But people who have a B&O often forget to talk about the design—they say it's about the way the product works.

[8] Hoover's, Inc., www.hoovers.com, accessed May 29, 2006.

B&O's customers were an elite group, according to Ballegaard:

> Our clients are business or liberal arts professionals over 20 years old, internationally oriented, appreciate the fine things in life and have a passion for perfection.[9] We offer them products that allow them to feel good at home, have a striking look, are easy to use, manufactured to the highest standards, and that last 15 to 20 years instead of the industry typical 24 months. One of our TVs has been around for more than 20 years, something unheard of in this business. Then we try to add a touch of magic, like the glass doors of a CD player that open with a hand wave, or the TV screen that turns towards you when you switch it on . . . people who believe in our products then attract others . . . that idea of buying a product that lasts and represents something appeals to people of a certain culture. Surely not to everyone, but we only address about three to five percent of the market. And I think there is value to be created in the connection of the emotional power of our designers and the power of our clients in the market. There is sustainability and growth here, we believe.

The company had introduced a new range of smaller products with lower prices to attract new, young customers. Explained Ballegaard: "Our new mobile phone Serene, for example, only costs about €1,000; our transistor radio, BeoSound 3, around €570. They still have our B&O quality, the unique design and use of material, so compared to [mass market] products they would still be at least five to ten times more expensive, but they help us get an entry into young families."

Making Bang & Olufsen Products

Although known for design, B&O had never employed in-house designers. As design director Flemming Møller Pedersen explained, this was intentional:

> We don't want [designers] to be [unduly] influenced by other parts of the organization . . . [which have] to worry about optimizing the daily business. [Designers] don't need to understand our industrial limitations . . . manufacturability, or what sound can come out of which form. Designers have to be free to look in an unconditioned way at what's happening in our society, how people live and furnish their homes, and then come up with proposals that could be good for B&O. It's up to our engineers to make it work.

One of B&O's most prominent designers, David Lewis, had been working with B&O since 1964 and had created some of its most famous designs. Born in London in 1939, he had been living in Denmark since the 1960s. Formerly an apprentice of B&O's main designer Jacob Jensen, Lewis had remained with B&O when Jensen and the company split in the 1980s. Lewis's design studio, called "Idealand," was based in Copenhagen, but 80% of his work was for B&O. He drove 350 kilometers to Struer every Thursday night to participate in meetings on Friday.

B&O worked with three other external designers and regularly "tried" new ones. When flat screen TVs started to take off, B&O launched a competition among nine designers from different parts of the world for ideas on what the B&O flat screen concept should be. Judging was blind, but when the identity of the winning designer was revealed, few were surprised: It was David Lewis.

To Lewis, there was no better company to work for:

> Here at B&O I can do everything I want. I don't think these kinds of places exist anymore elsewhere. It's all about the dialogue and the process of achieving the absolute optimum each

[9] "Bang on target," *Digital Life*, February 1, 2005, accessed via Factiva May 22, 2006.

> time, at each stage . . . we designers rarely get told what to do. Of course there can be guidelines if B&O, for example, needs a 40-inch TV at a given price point for its TV segment. In this case we need to work from there. But that's as hard as it gets. . . . Many things would of course be a lot easier if B&O were another company doing the "me too" sort of stuff. We'd just go out to all the exhibitions, take the best things, copy them, and be okay. But we don't do that. We like to think that we are the people that are copied. Which, so far, is the case.

B&O's reputation continually attracted new talent; CVs (curriculum vitae) of talented designers flowed in by themselves. In a firm so dependent on key designers, this access to new talent was important. Lewis was the carrier of B&O's design DNA, so the company needed him to impart it to younger designers, such as those in his Copenhagen office. Said Ballegaard: "We try not to have him influence them too much, as he has a very strong personality, but to have him hand some of his know-how and spirit over to the next generation." The firm had moved between chief designers before, and they were sure they could do it again. (See **Exhibit 6** for list of B&O products by designer.)

B&O had no standard process for product design and development but relied on a culturally evolved collaboration between designers, concept developers, engineers, and technicians. Close physical proximity to production departments further ensured interaction with partners in the process. A key word in the B&O design conversation was "Synthesis." Designers proposed a "thesis" or initial idea; engineers developed an "antithesis," an answer to the designers' proposals couched in terms of possibilities for realization. From a repeated cycle of thesis and antithesis emerged synthesis. The whole process, from idea to market, usually took one or two years, but could take much longer.

Idealand's dozen or so concept developers accessed a pool of about 500 engineers and technicians in B&O's Product Development department, tapping them for expertise in areas such as acoustics or materials engineering. Explained Eckhardt: "My department's key responsibility is to bridge art towards the repetitive processes of a efficient industrialized manufacturing process. And, true to our vision, to constantly question the ordinary. This also means always striving to break conventions, being on the edge of what is industrially possible, making it as hard for our manufacturing guys as we can."

Coming Up with the Idea

A product could start with an idea brought up by a designer or engineer, or with an opportunity arising from a new technology or material. "When a designer comes up with a new idea or form, he brings it to Idealand and tries to get us burning for it," explained Pedersen, "but inspiration can also come from our engineers [who] are constantly looking for new technologies [to] inspire our designers." About 25% of products arose from perceived needs to fill out the product portfolio. "We are a business, not an art school," said Ballegaard, "so product considerations come into play. We watch in which area we need to add a product. . . . But even on these given tasks we let our designers work freely and in their own interpretation of what will be the right concept."

Designers shunned market research when dreaming up new products. If Lewis visited customers, he went to see how they lived, not to ask them what they wanted in a new product:

> I don't think [customers] know what they want. They would ask for something that's already in the market, the hot item of the moment. This would be easier and cheaper to manufacture, of course, but we have to go beyond their expectations if we want to survive. We have to come up with something different which is completely B&O and which they can't resist. It's not a democratic process. Besides, we all are customers ourselves, so why ask others?

Lewis was skeptical about feedback from journalists or market experts also: "It's not useful. . . . When journalists saw our navigation wheel keypad on the Serene mobile phone they did not believe it would work, even though we had tested it over a long period, just because it was against what they expected to see from a phone." Pedersen, too, argued that the company's most innovative products might not have been developed if [the company] had asked for outside opinions at the idea stage.[10] They did take customer and dealer feedback into account once a product was launched, for eventual updates—as, for example, if a surface was not strong enough in ongoing use.

A lot of ideas got discarded for being not "B&O enough," too expensive, or technologically infeasible. But ideas had a way of reappearing. Lewis kept all his old designs because he had noticed that rejected concepts tended to resurface, and that the time was right for some of them the second or third time around.

Concepts with "Substance"

If an idea had potential, designers created models and brought them to meetings at B&O. Sometimes they pursued two or three in parallel, but often just one idea evolved in a sequence of iterations. The process continued, often for a year more, until the concept had *substance*. "Substance," explained Ballegaard, "means it should have a unique personality. We don't see ourselves as technology or gadget providers; we want to make things that become part of people's lives and are up to our values of simplification, convenience, and quality."

Designers might make 20 or more models before settling on a product form.[11] As Lewis explained, prototypes were often not very high-tech: "I usually first bring pieces of cardboard or wood. . . . Depending on how accurate we are in our thinking, we go on working with loose sketches on paper and cardboard before we come to more hardware models which use some of our technology." Newer, software-based prototyping environments were rarely used. Engineers and model craftsmen made heavy plastic versions before moving on to the actual material and starting to figure out how an item could be produced. No decision was made without designers, engineers, managers, and many others seeing and feeling a prototype. Said Eckhardt: "B&O is about what you see with your fingers and the design is its visual expression."

Once a concept had substance, it moved toward product commitment, which was based on much more than the business case. "The decision," reported Eckhardt, "is made with the heart. . . . Financial and technical realization considerations . . . are not the determining factors." If the decision was "go," product development assembled a project team to move the product toward launch.

Designers remained involved throughout development, consulting with engineers on surfaces or dimensions. The main issues were usually solved within the first year, but even in the later stages there could be changes. Explained Lewis: "We keep things open until the last minute, unlike [our mass market competitors] . . . if a convincing idea comes up in the middle of the process, we will ask to change the concept, even if its already far down the line." Eckhardt confirmed this B&O reality:

> If David says "I need 2.5 millimeters more on this TV because otherwise the dimension is completely wrong," then he is allowed to do that, even if it costs a secondary round and tooling, etc. . . . It's not the most efficient way of working. Our big competitors start with the

[10] According to Paul Ulrik Skifter, B&O's former CFO, "The only time we did market research was with Beogram 4000 (in 1972). Marketing people said it would sell 15 units in Denmark and 50 in the world. It turned out to be one of our most successful products." Reported in Verganti, 2006.

[11] "Innovator at Danish consumer-electronics firm interprets 'language of design'," *Bangkok Post*, October 11, 2004, accessed via Factiva May 22, 2006.

> electric conception of a TV and ask the designer to make something nice around it; we start by looking at how the customer wants to live with television and conceptualize that before it comes to our engineers. We will always prioritize the right product over timing or efficiency.

The BeoVision MX 4200, a TV designed by Lewis that had sold well for a remarkable 25 years, provided an illustration of the company's adherence to design driven innovation. Two weeks before Christmas, the high season for sales, B&O ran out of a component for the TV. To accommodate substitute parts, engineers needed to add two centimeters to the back corner of the TV. "I said, 'Two centimeters, what's the problem?'" recounts Ballegaard. "They told me they did not dare ask David. Then I had at least four meetings with him, where he said this would spoil the whole thing, and I argued that we were talking about big money. I expressed my understanding of his concern and added that he probably couldn't find a useful solution to the problem. Then David solved the problem with design, his way." Commenting on this story and others like it, Ballegaard added:

> Good designers are strong personalities. They are dangerous because they can walk out on the cliff if they think that's what they should do, but they are valuable because of their own strong interpretation of what you and I would like to have. And they are individualistic. Take the Serene mobile phone. David came in and said this is how it has to be . . . it did not look like a phone and was kept simple without the latest gadgets like downloading music. But he would not negotiate. That was exactly the point; he wanted to redefine what a phone is and emphasize what it's meant for.

The BeoSound 9000, a 6-CD player that displayed its loaded CDs in a straight line, had started out as a 10-CD player idea in the 1990s, and was turned down three times: Management thought it looked awkward and was too expensive to produce. Eckhardt recalled:

> It was a very provoking design. The board of directors, used to our more conservatively sleek, timeless, and flat audio systems, initially did not like the idea of prominently displayed CDs at all. But the designers and engineers kept working. Then the conceptual process matured and the directors got on board but from the decision point to manufacturing I think it took five years. It still is the most un-manufacturable product you can imagine, which is also the reason why no competitor ever made a copy. We can hardly produce it ourselves. But it has become one of our most successful products; you'll not find anything like it anywhere else. That's what B&O is about. You cannot achieve this in a company going for the last dime.

Similarly, the BeoLab 8000 loudspeaker that looked like an organ pipe standing on a spike was first presented at an Idealab meeting in 1991. Eckhardt again recalled:

> When Lewis came in claiming this was a speaker, our acoustics engineers said, "he's gone crazy. This will never play as good and loud as the traditionally wooden boxes, just look at the limited space inside this tiny sleek tube." But they kept trying to find a new way, and even though the tube finally had to be slightly higher and stand on the floor, we came out with a speaker that had a fantastic sound performance and a form defying any conventional design that sells very well.

Lewis added, "All the people here are enormously interested in technology and mechanics. They will go a very long way to resolve any issue that looks promising or interesting. Which is great for us designers. It's really in their culture—just give them a challenge and they go way out for it."

Twenty or so engineers watched other industries to identify promising new technologies. The banana-shaped BeoCom 2 phone, for example, used hydroforming, a technology used by Porsche to make exhaust pipes but which had never been applied to consumer products. B&O even had access to some of its big competitors' R&D labs: "They know we are a small player who will never beat them

in their segment," said Eckhardt; "they know we are good at conceptualizing and maturing new technology and we have high-purchase-power customers, which makes us a good R&D partner."

The emphasis on pushing beyond limits often caused delays. Said Pedersen: "This banana-shaped phone was delayed for two years. We had software problems, manufacturing problems in the area of the aluminum; it was cutting-edge technology. This was truly manufacturing for design, maybe a little too much so." Ballegaard admitted that managing in such an innovative environment was not always easy; "sometimes I think I am in control, but I am totally out of control," he said, referring to a Tom Peters quote: "When you're out of control, you're in control." Ballegaard continued:

> If you wanted to express power and determination as a manager here, it would be difficult, but if you allow a certain degree of freedom you get a very creative environment. We have a lot of respect for our creative people; we managers just facilitate the processes and balance them in the background. I personally support much of the skunk works, either by financing, being there, or selling it; I was pushing controversial concepts [when I was] at Lego myself, e.g., as the head of the team developing LEGO MINDSTORMS.

Manufacturing

B&O sited most of its production in Struer, alongside development offices (see **Exhibits 7** and **8**). Some production was being transferred to Koprivnice in the Czech Republic, where a new factory would open in 2006. About 200 jobs would move, along with B&O's testing and training, to maintain the company's high quality standards. External suppliers around the world made many components and a few finished products, but not those core to B&O differentiation; this practice had expanded in the past decade.

Most products were made to order, based on specific customer choices of many customized features. Smaller products, like phones and accessories, were made for stock. Making products to order limited inventory quantities in Struer and at dealers, and increased opportunities for adapting a product to a customer. Retailers submitted orders via a web-based system. A built-in configurator automatically suggested the accessories necessary for a customer's chosen setup. Within 30 seconds the retailer learned an expected delivery date that the customer could count on.

For products that required assembly, B&O aimed for five-day delivery in Europe, 10 days for more complex product variants. Common variants were kept in stock in the U.S., but for non-stock items, delivery time to North America was about four weeks. Products were delivered by airship to Asia, a practice that was expanding to other regions to reduce stocks in remote geographies.

At the plant, workers saw orders coming in on a computer screen. An operator at the start of each line printed them, selected needed materials, and put them on the assembly line, often in kits. The workers then assembled the product in stages, eventually arriving at testing. Workers were organized in production groups, responsible for both the quality of the products and the schedule necessary to fulfill delivery promises to customers. Every morning, workers met with line managers to discuss the previous day's results and to consider suggestions for solving problems.

Workers had high personal standards; Pedersen explained: "They reject parts during the assembly that, from a business point of view, would be okay, but which they judge not good enough. They almost all have B&O at home and have personal views about what they would want on their own equipment." John Bennett-Therkildsen, head of production, added: "Even in the factory, it's still about art in a way. Art pictures decorate the walls, and the meeting rooms are named after artists. And many of the blue collar workers are engaged in B&O's art club of 300 people."

Because of the broad portfolio produced in the plant, workers needed to be very flexible and skilled, able to work at different stations. Depending on the demand mix, they might be moved around within their production group or to different groups. Most sales happened in the weeks before Christmas. Peak production was from October to the end of January; employees worked long hours during the dark Scandinavian winter and took extra time off during the long days of summer. During high season, the plant might go from one to two or three shifts, and add temporary workers.

B&O set a daily production objective for each manufacturing line. If the customer orders were fewer than the daily objective for a line, workers used the rest of that shift to produce common variants for stock, so-called "fast runners." In TVs, it might be the basic unit in black that accounted for 60% to 70% of the sales in Europe. Every Friday, a meeting among production and customer center representatives adjusted numbers and objectives for the coming week. As the plan continually adjusted, even during the day, the setup of the line and the equipment in assembly had to be flexible. In the mechanics plant, where a flexible setup was more difficult to achieve, employees worked from forecasts, creating parts that would be needed for assembly. At the point where the two systems were coupled, there was significant inventory so assembly would not be constrained by parts shortages.

The line between R&D and manufacturing was less sharp at B&O than at mass-producing companies. The company could not afford to relocate some production too far from B&O's core competencies. Said Eckhardt: "There are strict competence structures such as the aluminum anodising bath where products get their different colors, the specific polishing and molding machines for plastics and aluminum that are essential to B&O's choice of material and surface treatment and give it the quality look and feel, and that we can't get done elsewhere." Bennett-Therkildsen agreed: "I am in constant discussion with Eckhardt; I have to run an efficient production process, and improve it from one year to the next, and he comes in shaking everything up each time with new products that don't follow anything that we know from the past."

Production layouts were tailored to each product. Manufacturing engineers were involved in the development process in order to stay informed about upcoming products and to contribute new ideas about surfaces or processes. Line workers took part in the first trial assemblies during development. Nevertheless, the introduction of a product into production did not always go smoothly. Said Bennett-Therkildsen: "I cannot remember that we ever gave up, because if we can't do it then nobody can. But there have been instances where we went so far as to ask for a design change, even though we know that's almost impossible here." The 6-CD changer had been one of those instances. Bennett-Therkildsen explained:

> Not only was it hard to figure out how to produce it in the first place, but when we tried it out we realized we needed one more millimeter where the cables run through in order to avoid a scratching sound when the arm was moving. But the designers said, "no way." That postponed the project for about six months. We finally came up with a new way to bend the wires that we called the "Christmas tree." Even after that, the product still required special manufacturing and assembly skills.

Accelerating Cycles

Although reasonably stable, the processes B&O used to bring products to market were changing. Ballegaard described his efforts to accelerate cycles involved in arriving at new products: "The frequency of contacts between top management and the product developers and the designers has increased, from every three months to weekly . . . it was crucial that we accelerated on this part. Of course, you have to do it in a collaborative way . . . people here are rather well educated and skilled,

you can't just push your arguments through." B&O had also taken steps to shore up the company's reputation for technology. Ballegaard stated:

> [A few years ago] there was this feeling that our technology was not top-of-the-league anymore—that it was more about the wrappings [and] design, the "pretty face syndrome." This was, in my opinion, endangering our brand and our very existence, so I asked our acoustics engineers to aim for the world's best loudspeaker. Out of that came the BeoLab 5, released in 2002, which was judged as one of the best speakers in the market by stereophile magazines like *Gramophone*. . . . In addition to the BeoLab5 statement, we also needed an urgent solution within the video area, so we set out to make the world's most advanced TV, the BeoVision5, which really brought B&O up to the very front line of quality, from traditional TVs to flat screens, and paved the way for us to survive the dramatic transition where one-third of our revenue (the CRT based TVs) disappeared within 2–3 years. . . . The technology threat will always be there in our fast-moving industry. But while we know that we can never become complacent in terms of technology, there are so many new ideas in our pipeline that I am sure we won't run dry. And because of our size we can never be technology leaders in everything.

Working with partners helped B&O keep current in technology and other areas where size mattered. "This may prove essential for our capacity to survive, to be able to rely on others," remarked Lewis.

Another major effort aimed to increase the number of new product launches. Five years earlier, B&O had delivered about one new product each year; the new objective was three to five radically new concepts each year.[12] In 1995 it took about four years to bring a new TV to market, but that was down to between one and two years in 2006. Competitors had reduced their time to market at the same time, so B&O's time to market remained twice as long as that of large competitors. Product update frequency had been increased too; some products changed annually, and most did every other year.

Accelerating launch and update frequency put pressure on the process. Said Lewis: "You can't do everything quickly. You have to think, and thinking takes time. And today it really should take even more time, as everything gets more complex. I am worried [that] our thinking time could become so reduced that it starts affecting our design and our ability to create products outside of people's expectations." Ballegaard, too, kept an eye on this concern:

> People say we are driving them tough and hard, but we are just asking politely, "When are you finished?" . . . I don't have to push them too much, as our people are very ambitious. And if you go see them frequently, just to show an interest (intelligently, that is) in how things are going, it makes people want to build a cathedral . . . we have our quality function throughout the organization and never compromise on that. We have had cases where we had critically important launches and already ran the marketing campaign, but when the product did not satisfy us in the final very strict test, then we give it another three months . . . From the financial side, I'm tempted to say, "Get the thing out," but gladly I am not the only one deciding; we have checks and balances in our system. And I can't overrule the system more than once a year, as morale would deteriorate. . . . Of course there is always risk. But the pace of the world and the increasing knowledge of especially our young customers only allow us a

[12] New product launches accounted for 10% to 15% of revenue, less than for mass market competitors, because B&O's classic products retained sales and margins for a very long time, compared with industry averages. (The technology inside products changed continually, but concepts stayed for a long time.) "Longevity is an important criterion when we approve a product," noted Ballegaard. "We have limited resources; we spend about 10% of our revenue on R&D and have around 300 internal and some external people on it. So without being selective, our model would not work. It is very important that products be home runs."

one- or one-and-a-half-year window to decide on the right choice. We can't just say goodbye to the world and have our own picks. It is a balance.

Idealab

Located on the same corridor as the model workshops, Idealab was created in early 2004 to explore extensions to B&O's product development processes, with a particular emphasis on computer technologies. Ballegaard explained:

> A company always has to balance continuity and renewal. We come from the material world. All our products at the end have a physical, tactile expression and probably will forever. But as we are seeing everything go digital, we need to inspire our designers not only with mechanical inventions but also with ways of using new digital technologies: New graphical user interfaces, new ways of interacting in the cyberspace, etc. Idealab was created close to Idealand so we could host the virtual world in parallel with concept generation. If we had put this new breed of people inside Idealand, they could easily have been steamrolled by the existing paradigms. Even now they still have a difficult position because they work on things you can't touch.

At first Idealab was Sorensen and two others, but by mid-2006 the group had grown to a dozen people with different backgrounds—business, design, software—several from countries other than Denmark. The staff kept up to date on state-of-the-art design process methods and used them to generate "low hanging fruit" ideas for generating supplementary revenues from existing company products—and to add digital functionality. Sorensen explained:

> We are looking at Blue Ocean opportunities, using our concepts in untapped and uncontested markets; at networking economies; at the media convergence; at new customer behaviors with media. . . . For instance, through media convergence, by making everything more personal, convenient, but keeping it simple, we can allow customers to travel around the media world without getting confused or stressed.

According to Sorensen, Idealab staff thought carefully about how to interact in the traditional B&O design discourse:

> We realized quickly that we would need to find an effective way to communicate with the rest of the organization and its processes, which have a history of 30 years. For the first eight months we worked on start-up processes, trying to find out what the communication forms should be. We found that our suggestions had to be very important to a product before they would get serious attention from the designers. They are used to tangible, cardboard models, and we tried to adapt to that way of communicating as much as we could.

As part of their effort, Idealab added a visualization and graphics initiative, and collocated the chief graphic designer with concept developers at Idealand. The group also build a demo facility that featured a living room, bedroom, and kitchen, all with B&O media equipment on which they could try out and demonstrate new interface and product integration concepts. Designers did not visit the facility often, and Sorensen did not press them: "We have to move very carefully to help people get an overview without making them cranky."

Supplementary functionality for existing products gained acceptance more readily than new concepts: "We might, for example, suggest having a TV not just show broadcasts but also get access to Net music through the Internet. If we decide to include Net music in our TV portfolio, suggesting how to do that in a unique way with a Lewis product, that would be one of the more digestible

moves." Sorensen added: "We learned that we could not go too fast. In the beginning, my people wanted to just go and get the things done, but we learned to tune into the company style, cautiously create inspirations, supplement the discussions." Idealab people were careful to only show function and avoid suggesting design elements when presenting their ideas. Sometimes it was difficult; functionality and design of a product were related, and both were part of the aesthetics of the product. Ballegaard acknowledged the need for integration: "Concepts more rooted in the virtual than in physical space will be very important for us . . . [but] in our products the virtual will always be together with the physical part."

There had been no theoretical discussion about how to integrate Idealab innovations into the traditional process; it happened by adding Idealab staff members to a concept team and letting the process play out. That way everyone knew what was going on, but changes were difficult when the old and new ways did not match up. Ballegaard said:

> More importantly, the acceptance of Idealab in the culture took longer than anticipated—probably because it took a long time for Idealab to get from fluffy whiteboard sketches and PowerPoints to something tangible. They spent too much time in the beginning running around "networking" and "communicating"—something we were not used to [doing] so much—rather, what gives credit in this culture is to deliver something with substance, something concrete. The fact that Sorensen and a few of the other members of Idealab came from a U.S. culture where personal visibility and "staging" sometimes seems to take precedence over actual delivery, there was a healthy resistance to much of the hot air, and almost some degree of impatience about why we were spending resources on so little results. . . . I often said to the guys: "Where is the beef?" Come up with something that can be implemented and turned into experiences and products that we can invoice—we cannot invoice visions—they are here to guide us! Everybody knew we needed the new paradigm, and the rest of the organization was eagerly awaiting a concrete child to be born—or just a first little step, but very little concrete came out from the smoke.

Some products already had significant software content. The Serene mobile phone had an elaborate software interface; BeoPlayer software included an iTunes predecessor that allowed customers to store and manage their music collections on a PC. But there was much untapped potential. Fuller software integration between B&O products would involve the creation of entire "back office" systems. Such systems, once created, would need support; dealers would have to be educated and software updates delivered reliably. The tradition of developing concepts product-by-product was not well suited to creation or upkeep of cross-product software systems.

There were definite signs of progress. A new organizational role, called a "producer," had been created with responsibilities across platforms and projects. Most of the producers already in place had software backgrounds and were working on cross-product software concepts. (Two of these had already found their way into products in production.) New software solutions did not necessarily have to go through the traditional process anymore. If an idea did not impact the physical design, the Idealab team could present it directly to the CTO and CEO. Software design was loosely linked to physical design. Said Ballegaard: "This way of decoupling the new from the traditional lab was on purpose. We wanted to make the conflict more explicit, enabling our process of thesis, antithesis, and synthesis when you struggle to a new solution." Sorensen felt that he was learning too: "I don't go to the designers and say, 'hey, we've got to have this or that.' I go to Pedersen and ask him to try to have something of this in there. He then tells the designers, 'by the way, there is stuff that you may want to get in there.' That's how it works."

The Big Meeting

Sorensen intended to argue that the product that would be the focus of the meeting needed to venture into unknown territory. It should be, he thought, 50% software and 50% physical product, instead of usual split that was often more like 10% and 90%. If he could convince his colleagues, the impact would be wider than one project; Sorensen stated:

> We could be at a tipping point. This could *the* project that accomplishes a significant process change. It could allow us to organize our content in a truly different way. It's a "converging" digital audio/video product where audio/video and IT technologies merge. When we first submitted this proposal, the new solution was to be attached to an existing physical design. Ultimately, though, we felt that we needed to recreate the physical design to enable this convergence paradigm. If the physical design is not born with this purpose in mind, it's very difficult to get the hammer out and start beating the thing into shape. It's been a painful process with a lot of debate for about a year, but we may have found the solution even though the first version will probably not get out before 2008. But if we are lucky, we'll at least be allowed to submit it to the formal management meeting that decides if we get the green light to go ahead with it.

Not everyone agreed on the need to push fast into the digital future. As Ballegaard acknowledged, "This is not about sales; I don't think people are going to wake up in the morning and ask for our digital products." Lewis felt that consumer electronics companies were too keen to use all the latest features of modern technology, to make everything bigger and faster without necessarily making it better. In his view, competitors were too quick to add functions that the user did not need. Sorensen had to acknowledge that B&O's traditional process created experiences that evoked unmatched passion in customers and achieved stark differentiation from competitors. The company's products were unquestionably beautiful; the only question was the degree to which (and how soon) customers would consider integration with the virtual a vital aspect of beauty.

At the most recent quarterly meeting of the firm's top 60 managers and researchers, someone had asked when Idealab would start producing results. Sorensen commented:

> They know we are running a lot of activities, but they have not seen anything in the [retail] shops, so they are skeptical. If you went into our new AVI group [that is] charged with implementing our new concepts, they could show you a whole range of Idealab ideas, and in which products they will be used from 2007 onward. Our service division could also tell you about the new projects that we have with them. But in the core design and product development group, people still wonder why they need this new paradigm. B&O is making a lot of money, so if it works, don't fix it! Besides, most of the people here, management and workers, have been around for a very long time. They have been through the difficult times and [the] near-death experience in 1992, so the appetite for risk-taking is low.

Ballegaard knew he was engaged in a balancing act:

> Normally we try not to influence our innovation process from the management side, as it has to live its own life. But in order to ensure that the input from people who understand the virtual world gets considered, we can interfere in the process and make sure we take in new people who appreciate that world. If you are not of the generation that uses computers, that lives and breathes the new world, you cannot embrace it. On the other hand, if you are too hyped up and think everything is virtual, you may have forgotten that physical expressions of serenity, tranquility, and longevity are still essential to human beings. . . . I am myself monitoring and balancing these processes making sure that the old regime is not rejecting these new weird software guys and on the other hand, that the software guys must not come

flying in like Bill Gates copies saying we can do everything. And I must say that we underestimated the time it would take for Idealab to come from PowerPoints and visions to something concrete and "tangible"—i.e., a software attribute/function or technology component, that could be demonstrated to add value to the users convenience and experience—not some hypothesis about how the "next generation of tech-freaks" would live in the virtual space. . . .

We really want to have symbiosis between the two . . . we balance it in a subtle way, mainly through discussions in which I get involved. We talk about our values and the pros and cons of different things. It's not a traditional way of managing but a very indirect one. It may be part of our Scandinavian heritage, as the power distance in this part of the world is extremely low. We are good at working with people of different opinions and getting the best out of a meeting. So we allow a lot of internal discussion, which is rarely affected by people's egos, as it focuses on the idea.

But don't get it wrong. This is not democracy, or a soft consensus. We have to make harsh decisions, stop discussions, give someone two more days to figure out what they want, tell a designer his project is going nowhere, abort certain ideas, or form a new team around it. When they must, these things do happen here.

Exhibit 1 B&O Products (Selection)

Serene Mobile Phone

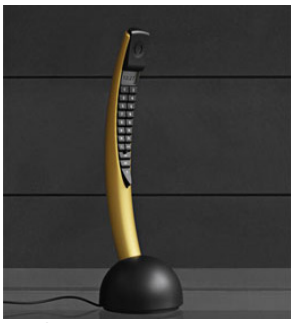
Beosystem 1200, introduced in 1969

BeoLab 5 loudspeakers with BeoSound 9000

BeoSound 9000

BeoVision 7 and BeoLab 8000

BeoVision MX 4200



BeoCom 2

BeoSound 3

Source: B&O website.

Exhibit 2 B&O Current Product Portfolio and indicative Price Points in early 2006

Product	Launch	Retail Price[b] (in euros)	Product	Launch	Retail Price[b] (in euros)
Televisions			**Loudspeakers (per unit)**		
BeoVision 5	2002	19,165	BeoLab 5	2003	7,312
BeoVision 4-65”	2005	15,004	BeoLab 1	2000	3,089
BeoVision 4–50”	2005	7,502	BeoLab 8000	1992	1,702
BeoVision 4–42”	2001[a]	5,170	BeoLab 6000	1992	1,197
BeoVision 4–37”	2004	3,480	BeoLab 2	2001	2,395
BeoVision 6–22”	2003	3,278	BeoLab 7-1	2004	2,521
BeoVision 6–26”	2004	4,286	BeoLab 7-2	2005	2,710
BeoVision 7–40 inkl BeoLab 7-2/7-4	2005	9,240	BeoLab 7-4	2005	2,710
BeoVision 7–32” inkl BeoLab 7 -1	2004	7,627	BeoLab 3500	1997	1,386
BeoVision 7–32” inkl BeoLab 7 -4	2004	7,816	BeoLab 3	2004	1,386
BeoVision MX 4200	2003	1,563	BeoLab 4000	1997	945
BeoSystem 2	2004	5,623	BeoLab 4	2005	467
			BeoLab 2000	1992	882
DVD/Harddisk recorder					
HDR1	2005	1,260	**Telephones**		
DVD1	2000	1,134	BeoCom 2	2002	504
			BeoCom 6000	1998	227
Music Systems			BeoCom 4	2003	289
BeoCenter 2 + connector module	2003	3,530	BeoCom 1401	1996	75
BeoSound 9000	1996	3,593	BeoTalk 1200	2001	201
BeoSound 3000	2001	1,891	Serene Mobile	2006	1,000
BeoSound 3200	2003	2,521			
BeoSound 1	2001	1,260	**Accessories**		
BeoSound 2	2003	466	Earset 1	2003	138
BeoSound 3	2006	567	Earphones A8	2000	132
BeoSound 4	2006	1,765	Form 2	1986	88

Source: Adapted from Handelsbanken Capital Markets data on Bang & Olufsen, January 16, 2006, p. 12, via Thomson Research/Investext, accessed June 2006.

Notes: Several products have been updated since their introduction.

B&O product names: BeoSound refers to a line of music systems, BeoVision to televisions, BeoLab to a line of loudspeakers with built-in amplifiers, BeoCom to telephones, and BeoSystem to a line of products that work together.

[a]Introduced in the U.S. in 2001, in the rest of the world in 2004.

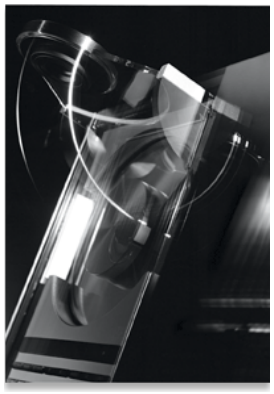
[b]As each retailer fixes its own prices, these price points are only approximate indications.

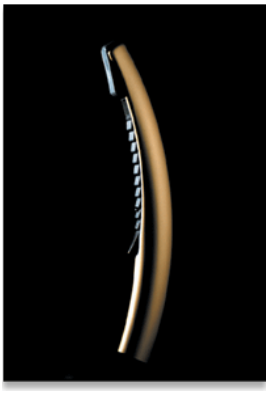
Exhibit 3 Bang & Olufsen Five-Year Summary

Group (DKK million)	2004–05	2003–04	2002–03	2001–02	2000–01
Profit and loss account					
Net turnover	3,742	3,610	3,974	4,212	3,810
Turnover in foreign markets as percentage of above	82	83	81	81	80
Operating profit	380	337	296	260	283
Financial items, net	7	2	(9)	(35)	(50)
Result from ordinary operations before tax	387	341	290	228	236
Group result	269	266	193	138	156
Result for the year, Bang & Olufsen A/S's share	269	264	190	149	162
Balance sheet					
Total assets, end of year	2,762	2,721	2,572	2,504	2,466
Share capital	124	124	134	134	134
Equity, end of year	1,751	1,652	1,551	1,406	1,308
Minority interests	2	2	1	-	1
Cash flow for the year	259	28	296	184	(157)
Of which cash flow from:					
Operating activity	741	448	643	433	222
Investment activity	(233)	(195)	(245)	(224)	(327)
- of which investment in tangible fixed assets	(123)	(138)	(132)	(150)	(269)
- of which investment in intangible fixed assets	(125)	(147)	(146)	(85)	(91)
Financing activity	(249)	(225)	(102)	(25)	(52)
Employment					
Number of employees at year-end	2,331	2,339	2,636	2,871	2,776
Key figures					
Profit ratio, %	10	9	7	6	7
Rate of return, %	18	15	13	11	13
Return on equity, %	16	17	13	10	12
Current ratio	2.7	2.6	2.6	2.1	1.9
Equity ratio, %	63	60	60	56	53
Earnings per share (nom. DKK 10), DKK	22	22	15	11	13
Intrinsic value (nom. DKK 10), DKK	141	133	115	112	105
Quotation as of May 31 (closing price)	389	355	159	235	268
Price/earnings	18	16	10	21	21
Quotation/intrinsic value	2.8	2.7	1.4	2.1	2.6
Dividend paid/proposed per share (nom. DKK 10), DKK	12.00	7.00	7.00	3.50	3.50

Source: Adapted from B&O annual report 2004–05.

Exhibit 4 B&O Values

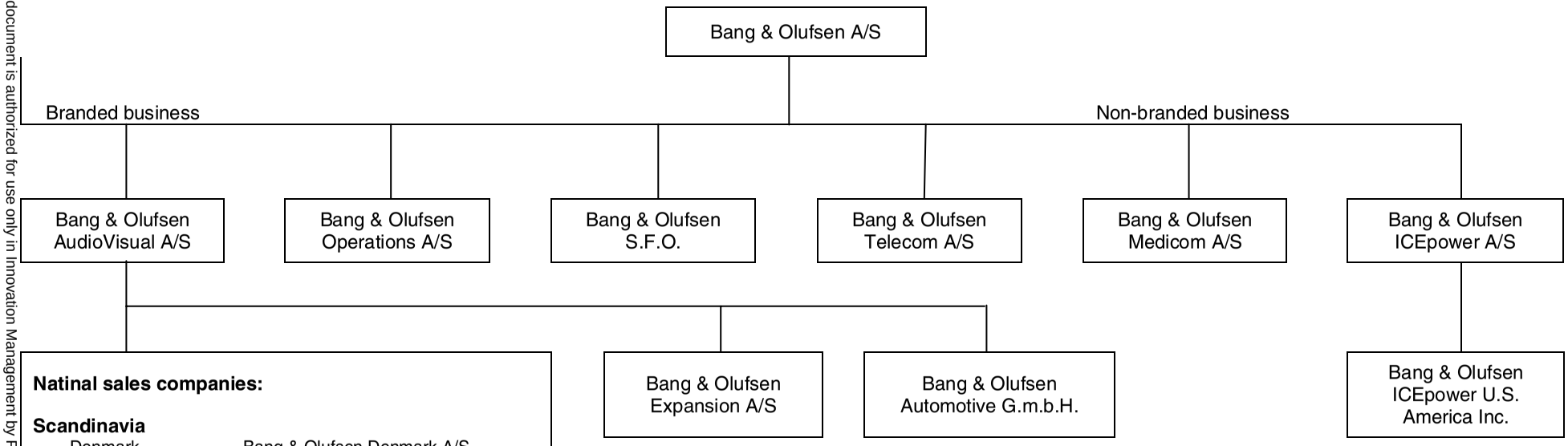





PERFORMANCE	DESIGN	HUMANISATION	CRAFTMANSHIP
Viewing and listening experiences that continue to surprise and delight every time you watch television or listen to music, and technology that works for you, not the other way around; that is why Bang & Olufsen is all you ever will need or want for your home entertainment.	For Bang & Olufsen, design is far more than mere styling of existing products; rather it is the expression of an idea, the concept made conscious. In this sense, design unites aesthetics and function, creating unique, highly differentiated products that are not limited by the time of their creation or the space in which they are placed.	Designed to be a part of the home and give pleasure, Bang & Olufsen's audio and video products offer the opportunity for you to personalise your viewing and listening spaces. Our products speak one language, offering home integration on your terms, and where you interact up close by touch, or pleasurably sitting back with the Beo4 remote control.	The quality of finish and craftsmanship of a Bang & Olufsen product encourages you to approach and touch. Our uncompromising attitude to quality is the reason we create products and experiences of real and lasting value, with a quality that is much more than is expected.

Source: B&O website.

Exhibit 5 Organization Chart



Natinal sales companies:

Scandinavia	
Denmark	Bang & Olufsen Denmark A/S
Norway	Bang & Olufsen A/S
Sweden	Bang & Olufsen Svenska A/S
Central Europe	
Germany	Bang & Olufsen Deutchland G.m.b.H.
Switzerland	Bang & Olufsen AG
Austria	Bang & Olufsen Ges.m.b.H.
Rest of Europe	
United Kingdom	Bang & Olufsen United Kingdom Ltd.
Belgium	Bang & Olufsen Belgium N.V.
Holland	Bang & Olufsen B.V.
France	Bang & Olufsen France S.A.
Spain	Bang & Olufsen Espana S.A.
Italy	Bang & Olufsen Italia S.p.A.
North America	
The U.S.	Bang & Olufsen America Inc.
Asia	
Spain	Bang & Olufsen Japan K. K.
Singapore	Bang & Olufsen Asia Pte Ltd.
Middle East	
Middle East	Bang & Olufsen Middle East FZ-LLC

Source: B&O, 2004–05 annual report, pp. 28–29.

Exhibit 6 Major Product by Designer

Designer/Design House	Major Products Designed	
Acton Bjørn (1910-92) and Sigvard Bernadotte (1907-2002)	Beolit 500	
Designit A/S, Denmark	BeoCom 3 (iF Winner 2002)	
Ib Fabiansen	Modular System - Unit furniture, 1958 Dirigent	
Gideon / Lone Lindinger Löwy	BeoCom 750 BeoCom 2000 & BeoCom 1000 (iF Winners 1990) BeoCom 2100 BeoLab / Beovox Penta range	
Anders Hermansen	BeoLab 2000 (iF Winner 1996) A8 Earphones	
Martin Iseli, Switzerland	BeoCom 1400 BeoCom 1401 BeoCom 1500 (iF Winner 1992) BeoCom 2400 BeoCom 2500 BeoCom 5000 (iF Winner 1996)	
Georg Jensen	Clock/barometer set Expandable book ends	
Jacob Jensen	Beocenter 1500 Beocenter 7000 Beocenter 9000 Beocenter 9500 (iF Winner 1990) Beocord 1600 Beocord 1800 Beocord 2400 Beocord 5000 Beogram 1000 Beogram 1200 Beogram 1800 Beogram 4002/4004 Beogram 4000 BeoLab 5000 Beolit 1000 Beolit 400 Beolit 600 (iF Winner 1970)	Beomaster 1200 (iF Winner 1970) Beomaster 1700 Beomaster 1900 Beomaster 2000 Beomaster 2000 Beomaster 3000 Beomaster 3400 Beomaster 5000 Beomaster 6000 Beomaster 6000 Beomaster 8000 Beomic 1000 Beomic 2000 (iF Winner 1970) Beomic 8 Beosystem 5000 Beovox 1000 Beovox 2500 Cube loudspeakers Beovox 2700 Beovox 3700 Headphones U70
David Lewis	Beocenter AV5 Beo1 Beo4 Beocenter 1 Beocenter AV5 (iF Winner 1998) BeoCom 2 Beocord V8000 Beocord VX5000 BeoLab 1 BeoLab2	Beolink 7000 (iF Winner 1991) BeoSound 1 BeoSound 2 BeoSound 3000 BeoSound Century (iF Winner 1994) BeoSound Ouverture BeoSound 9000 (iF Winner 1996) Beosystem 1 Beosystem 2500 Beovision 1/1LS

Designer/Design House	Major Products Designed	
	BeoLab 2500	Beovision3
	BeoLab 6000	Beovision 3500
	BeoLab 3500	Beovision 5
	BeoLab 4000 (iF Winner 1998)	Beovision 600
	BeoLab 8000 (iF Winner 1992)	Beovision Avant (iF Winner 1996)
	Beolink 1000	Beovision AV9000
	Beolink 5000	Beovision MX Series
		Beovox Redline
		DVD1
Erik Rørbæk Madsen	The tonearm and MMC cartridge principle	
Henning Moldenhawer	Beomaster 900	
	Beovision 3000	
	Beovision 6000	
	Beovision 8900	
Steve McGugan	Form 2 Headphones	
Anne Mette Sonnicksen	Designing interface menus for B&O televisions	
Henrik Sorig Thomsen, Denmark	BeoTalk 1100 (iF Winner 1997)	
	BeoTalk 1200	
	BeoCharger (iF Winner 1995)	
	BeoCom 4	
	BeoCom 6000	
	BeoCom 9800	

Source: Adapted from the Beoworld website (an unofficial website dedicated to B&O), at http://www.beoworld.co.uk/, accessed July 7, 2006.

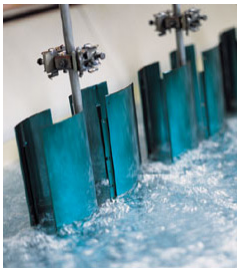
Exhibit 7 B&O Factory Tour

1) Old Factory: Factory 1 (from 1948) houses Idealand, product development, and product testing facilities.

2) Tool Factory: Factory 2 is where early prototypes and working models are developed and produced for Idealand, and where development and implementation of the systems, processes, and equipment necessary for the manufacturing process takes place.

3) Logistics: A subterranean conveyor belt ferries finished products to the warehouse, where, equipped with specific ID tag, the product is stored prior to shipping.

4) Assembling Plant: All assembly of B&O's audio and video products take place in factory 4. This is no conventional factory environment; small, autonomous production groups have complete responsibility for the daily production in the group's area. The assembly work flow and team is adapted to each product.

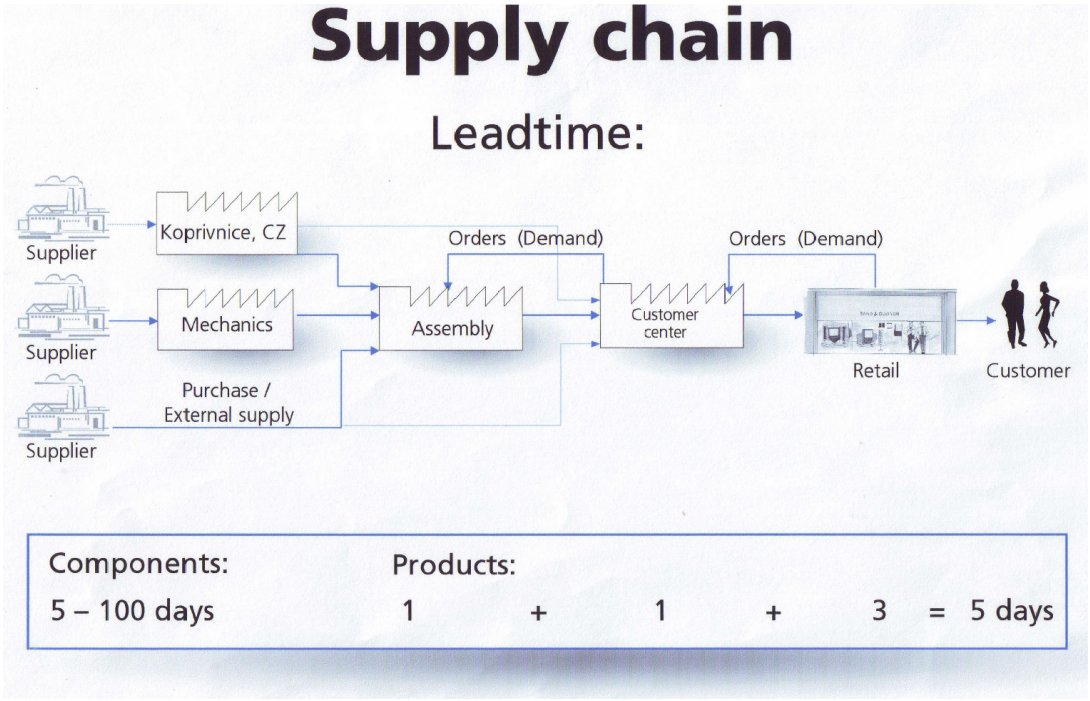


5) Mechanics Plant: The various production processes that take place here include plastic moulding using B&O designed and manufactured tools, the milling, polishing, brushing and other specialist surface finishing of aluminium, the silk-screen and sublimation printing and UV-lacquering of plastic and aluminium parts. Factory 5 houses B&O's advanced aluminium anodizing facility.

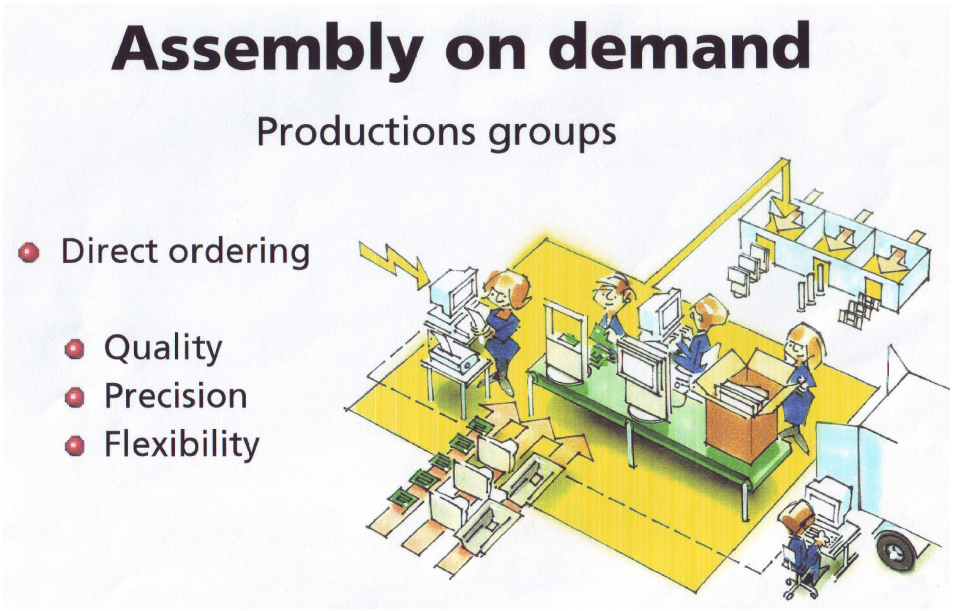
6) The Farm: Dating from 1998, this is the main administration building for B&O, and is the work of the architect Jan Søndergaard, who drew his inspiration from the isolated farm houses of western Denmark. The spatial experience of the building, expressed through the use of Icelandic basalt, sand-blown glass and in-situ cast concrete surfaces together with light wooden floors, creates an atmosphere that also pervades the production facilities.

Source: Adapted from B&O website.

Exhibit 8 B&O Operations



Source: B&O.



Source: B&O.