

*I think it is really important
for the computer industry,*

or any industry which is us-

ing designers, to under-

stand that design is a pow-

erful tool that can be very

effective in helping compa-

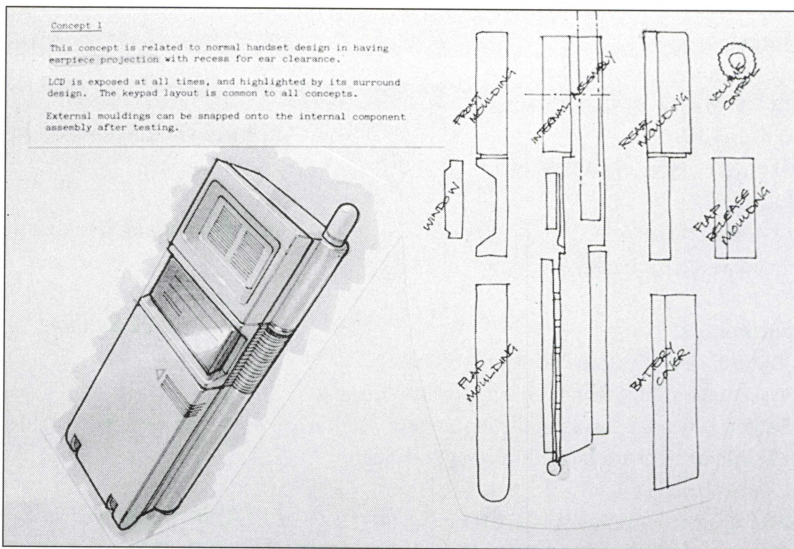
nies realize their corporate

Dancall Logic Mobile Telephone Design Project

Peter Spreenberg

IDEO

IDEO's user-centered design process is composed of six stages: understand, observe, visualize, evaluate, refine, and implement. These stages seldom occur sequentially—it is more common for us to be engaged in two or more simultaneously and iteratively. Here we describe the process in more detail as it was applied to the development of the *Logic* range of mobile telephones for Dancall, a medium-sized Scandinavian manufacturer.



vision and goals. It is not

a superficial surface treat-

ment to be brought in and

used at the end of a project.

— Alben+Faris

Understand

Although IDEO had prior experience designing telecommunications products for Dancall, we needed to understand more about the design objectives for the *Logic* range. We began by asking questions like, "Who are the users?," "Do they have any special requirements?," and "What are the opportunities and limitations of the technology?" This questioning process helped us arrive at a succinct project brief.

Observe

Observations and interviews allow us to gain an understanding of the people who will use a

product or system. For Dancall, we interviewed a small number of car telephone users to understand how they used their phones and to appreciate the kinds of difficulties they had in using them. We find that conducting detailed observations of a few selected users is preferable to the "wide and shallow" studies typically conducted by market researchers.

Visualize

Observations help designers to understand today's uses and scenarios but the creative leap occurs when we develop scenarios of the future. We developed four characters that represent Dancall's market: a Finnish architect, a UK insurance agent, a Malaysian entrepreneur, and a Danish salesperson. We created scenarios for these characters to help us imagine how they would use cellular telephones. As we developed the scenarios, the characters began to take on lives of their own. We created sketch drawings, models, and storyboards of concepts that fit each character's occupation, personality, and lifestyle.

Evaluate

Evaluation is an on-going activity and should be an integral part of development. For Dancall, we tested user interface simulations and appearance models in focus groups with potential users. Human factors designers play an important role in this stage and provide "reality checks" for design concepts.

Refine

In this stage, the more promising concepts or innovations are refined. For Dancall, we assembled photographic storyboards that showed our scenario characters using appearance models. We also developed engineering prototypes of some mechanical components and interactive simulations to demonstrate the appearance and behavior of the user interface.

Implement

During this stage, IDEO generates mechanical drawings for tooling and manufacturing of the hardware components and detailed guidelines and specifications for the user interface appearance and behavior. We worked closely with Dancall to ensure a smooth hand-off to their in-house engineering group.

We are convinced that the scenario development process enables us to provide more innovative and appropriate product solutions. The *Logic* range has been well received throughout the industry and has won numerous design awards. The



Figure 1: Upon Nil's promotion, the company bought him a cellular telephone and a facsimile unit for use in his SAAB 9000 car. His personal cordless handset, which he uses in his office and at home is also compatible with his car's new system. While driving, he uses the telephone voice recognition controls. He likes the way this lets him keep his hands on the steering wheel and retain control of his car.

designers involved represented different disciplines and backgrounds—industrial design, interaction design, human factors, and engineering—and IDEO believes this multi-disciplinary approach to design contributed in part to the success of the products.

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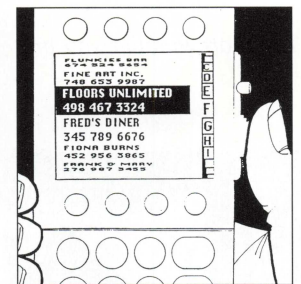


Figure 1: The central part of the displayed text is clearly legible. The upper and lower periphery is compressed to give an indication of text to come. The display lists all the numbers in the memory alphabetically. He can Scroll through the letters on the right side of the display by using the thumbwheel. To select, he pushes the small button next to the thumbwheel as the reversed-out scroll bar passes over the vendor's number.

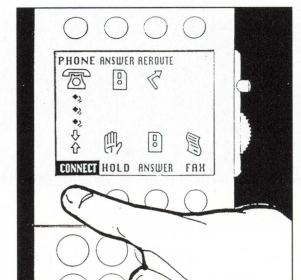


Figure 3: Nils touches the 'Telephone' key and the selected number appears in the telephone display. He pushes the 'Connect' key below the display. The display graphically shows a connection being made to the vendor's telephone. Icons along the top line of the display show that the vendor also has an answering machine and a call re-routing number is available. Nils could choose to direct his call to either of these by pushing the soft key next to the appropriate icon.