Klaus-Peter Wegge heads the Accessibility team at C-LAB in Paderborn, Germany. In 1994 he developed a pioneering Internet browser for the blind.

An Internet for Everyone

The needs of elderly and disabled people are playing an increasingly important role in the development of cell phones, washing machines and websites. But ease of operation benefits all users.

Wegge knows what he’s talking about. Not only is he an IT specialist, he’s blind. Wegge heads a small team at C-LAB, a joint research and development laboratory run by Siemens and the University of Paderborn in Germany. Wegge’s team concentrates on accessibility, the quality that makes technology easy to use for older and physically challenged users. It’s often the small things that cause problems for the disabled when they want to make a call or use a washing machine. A classic example was the lack of an acknowledgment tone in the first S55 cell phones. That’s something that just slipped past the developers, Wegge surmises. To prevent a repeat performance, Wegge, 43, has built up a network with other disabled people who report back to the Siemens Accessibility Competence Center whenever they discover a hidden weakness in a product. For instance, an acquaintance drew his attention to the fact that in areas close to the German border, there’s no way of knowing if a cell phone has logged into a domestic network or a more expensive one in the neighboring country. “We’re working on a solution for our next generation model,” says Wegge, leaving open whether the answer is different acknowledgment tones or simply blocking foreign networks. “We advise developers, but we don’t tell them what to do,” he adds. Besides, Wegge often comes up with solutions as soon as he becomes aware that a problem exists.

Speaking of Text Messages. The specialists from C-LAB are particularly proud of the interface used in Siemens cell phones. It meets all the standards and has also been incorporated, in a trimmed-down version, in the new Siemens cordless Gigaset 5000 Micro. To demonstrate, Wegge plugs a keypad the size of a pair of glasses into my S55 and pushes a few buttons. A female voice begins to read out my saved text messages. “I hope you don’t have anything obscene on this,” he says with a grin. It was Wegge who caused a sensation at the 1994 CeBIT computer trade fair with an Internet browser that could convert websites into simple text files, thereby making them accessible to the blind via a Braille display.

When Siemens Corporate Technology first set up the Access Initiative back in 1998, Wegge was immediately asked to come on board. Since then, he has been the company’s expert for technology oriented to the needs of the disabled. And it’s an effort that pays off. Wegge estimates that at least 65 percent of all blind cell phone owners use Siemens phones. And that figure could increase. The new SK1 can be equipped with software from Switzerland’s Sxox that reads out menu items and text messages. At almost all Siemens Groups there is now a contact person responsible for accessibility issues. However, convincing them is not always easy, says Wegge. Apparently, it’s much easier to get an engineer interested in a wrong theory and sometimes even carried away — than a product manager who is often skeptical about features that don’t seem to be commercially viable. Here Wegge has a persuasive response. “In Germany alone, ten percent of the population is disabled in some way or other. That’s eight million people. Can you really afford to neglect them?” he says. And as far as mass-produced goods are concerned, Wegge also emphasizes the benefits for the non-disabled. “Design for all” is his motto.

That such an approach bears fruit is evidenced by the new cordless Gigaset E150 phone from Siemens which was launched in October, 2003. It was a project in which Wegge’s team played a major role. The phone features large keys, a louder handset and ringing tone, an emergency call button, and large print for the display. Says Wegge, “It wasn’t always certain that the unit would make it to the market.” But he’s convinced that the phone should not be marketed with a “suitable for senior citizens or the disabled” tag, because that stigmatizes people and is bad for sales.

“Universal design is there to serve everyone, including the non-disabled,” says Professor Christian Bühler from the Research Institute for Technology to Help the Disabled in Volmarstein, Germany. “After all, as far as humans are concerned, diversity is the norm.” That’s why design that ensures easy operation is highly attractive to both young and old, disabled and non-disabled. In fact, achieving such designs is a process that Bosch and Siemens Hausgeräte GmbH (BSH), which sells white goods, has refined into a fine art. Right from the development stage, checkpoints help ensure that products meet the needs of the disabled. “But total accessibility must not be allowed to affect functionality,” says Bühler. “That would drive costs over the edge.”

Universal design serves everyone. The “suitable for senior citizens” label stigmatizes the aged and is bad for sales.

Strict Regulations. Accessibility has become a hot issue since legislation in the U.S. introduced strict penalties for companies failing to ensure that their products meet the needs of the disabled, while also meeting the latest technological standards. For example, if the Federal Communications Commission (FCC) were to determine that a Siemens cell phone was incompatible with hearing aids, the cable was considered worthless. The manufacturer responded to the criticism by offering a cordless version.

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bines or medical technology sectors. “That’s like making the whole family liable for something committed by one member,” says Wegge. Not that Siemens has ever found itself in such a situation. But even well-intentioned measures can miss the mark. While drinking coffee in a fast-food restaurant at a Chicago airport, he discovered something written in Braille on the cup. But the cup was so hot that he had burned his fingers before he could read it. Later, when the cup was empty, he was able to make out the warning: “Careful, hot!” A nice thought, says Wegge. Sanctions are less drastic in Germany, where the Equal Opportunities for the Disabled Act has been in force since May 2002. The law stipulates that the disabled must not be excluded from using the Internet and other technologies. “All federal agencies must make their websites suitable for use by the disabled by 2005 at the latest,” explains Stefan Berringer from the “Web for All” association in Heidelberg. The organization advises companies and public authorities on how to design their websites. For Berringer, a wheelchair user, hindrances in the Web are just like a high curb on the sidewalk: “It’s not me who’s disabled; it’s what’s disabling me that counts,” he says. Even seemingly minor hindrances can become insurmountable obstacles. For example, the instruction “Click the red button” is of no use to someone who’s color-blind — yet as many as eight percent of all men have this disability.

A survey by the German Ministry of Economics found that 43 percent of disabled people have legibility and navigation problems on the Internet. That’s regrettable given that the Internet is an ideal means of contact for many disabled and elderly people. Indeed, around 80 percent of disabled people use the Web. By contrast, for the population as a whole, the proportion is only 50 percent. Moreover, a truly accessible website needn’t require more work to create, provided that this is taken into account from the very beginning. The people from “Web for All” recommend the use of style sheets that allow design to be separated from content, which can be listened to with voice software or read via a Braille display. It’s also important that pictures, logos and buttons should also be equipped with text that appears when clicked.

Exemplary Search Engine. Anna Courtpoznia, who tests Internet sites at “Web for All,” had to grin at the well-intentioned advice she found on the website of a municipal utility: “If you can’t see the text, please click here.” However, Courtpoznia couldn’t see the text or click the button because she’s blind. Less than ten percent of all websites are genuinely accessible to the blind, although 80 percent of them can be used with a little patience and experience. The Google search engine is an exemplary site in this regard. On the other hand, those sites where new windows continually open of their own accord are annoying. As Courtpoznia says, these can be links to sex sites or simply advertising that pops up back. At C-LAB, Klaus-Peter Wegge recently discovered a highly disabled-friendly site for a chain of adult stores. He grins: “Even so, it’s sites like these that really make you regret being blind!”

Developer Bernd Holz auf der Heide displays an avatar on a demonstration model of the new SX1 cell phone.

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hese images are Cora, Liam, Cyberella and Womble. They are small, globular and green. They advise customers at banks and call centers, guide visitors through ministries and research institutes, and teach at schools and universities. They can also read cell-phone SMS messages out loud, as in the latest development from Siemens Information and Communication Mobile (ICM) in Munich. But in spite of their many capabilities, their speech comprehension is still limited and only truly effective in narrowly defined conversational situations. Welcome to the world of avatars, creatures that exist only in computers. They are as varied as the tasks they perform. But they have one thing in common: They are all supposed to facilitate access to systems and information.

Originals, these creatures made of pixels and polygons were intended to act as the Internet chat identities of their flesh-and-blood counterparts. But today they prefer to roam around in computer games and educational software. The emotional, personal way in which they address users, their independent lives and, last but not least, the fun factor that goes along with them, add zest to even the driest topics. But what’s really important is that virtual assistants can make it significantly easier to operate a great variety of devices and systems. Whereas avatars are the “face” presented to the customer, the actual work is performed by software agents (see Pictures of the Future, Fall 2001, p. 50). The latter race through the Internet like bloodhounds and search for information in databases, flight schedules, or instruction manuals. They give their spoils to avatars, who then present them to users. “Living Characters is our expression for assistants and avatars in the virtual world,” says Bernd Holz auf der Heide, manager of the Living Characters project and an expert in user interface innovations at Siemens Information and Communication Mobile (ICM). Holz Auf der Heide and his team were the first to develop avatars that live in cell phones. No later than next year, a cute, big-footed creature named Womble will hop, splash, pout and make merry on the display of the Siemens SX1 cell phone. Womble will make using a cell phone more fun. For instance, when the battery is recharging, Womble’s body will display a rainbow of stripes. When not in use, Womble will juggle balls, watch