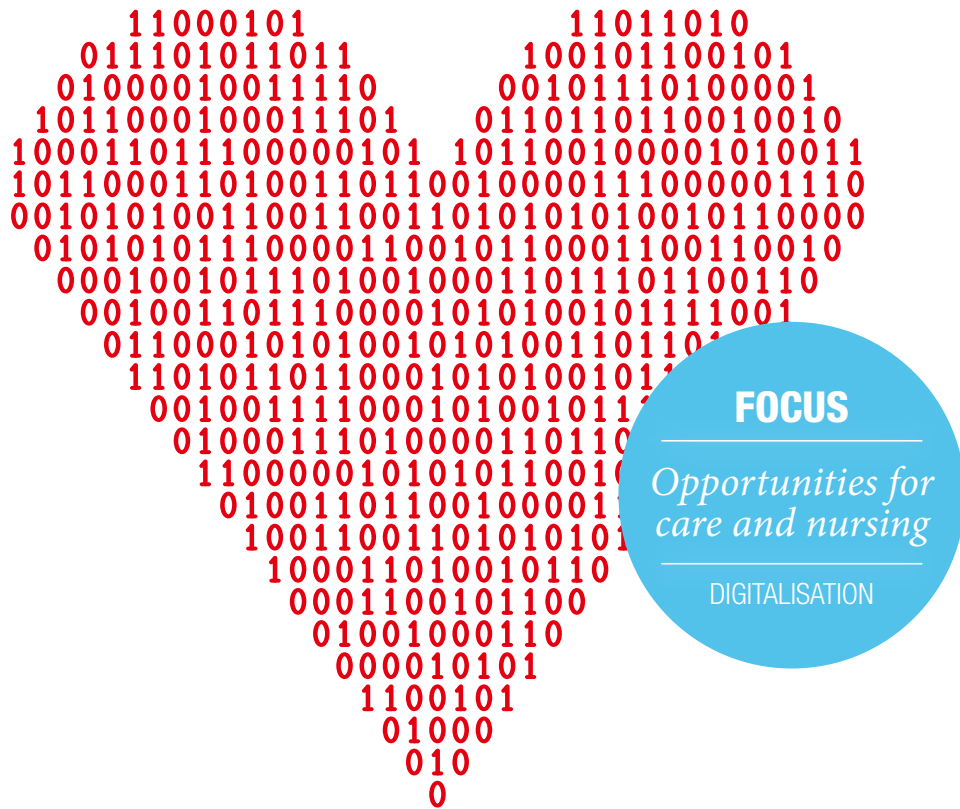


PROconcept

Providing advice for care and nursing homes



Quick or slow?

Digital solutions capture care



Digitalisation in care – Hype or genuine opportunity?

FOCUS
Opportunities for care and nursing
 DIGITALISATION

Food from the printer or a robot as a care provider? Sounds like science fiction. But nevertheless a justified question. Demographic change is set to massively transform the nursing care landscape in Germany. As the population continues to age resulting in a greater need for institutional care, the number of qualified carers is diminishing by the same token. Could digitalisation be the response to this challenge? This possibility will be explored in this current edition. We want to know just how digitalised care already is. And which digital concepts will it be possible to implement in future? One thing is sure: Nursing care will remain a service provided by humans. And quite rightly so. But if technology and automation can add to care professions in future, improving the standard of individual care and the quality of life of residents, it is a win-win situation all round.

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LEGAL NOTICE

Miele & Cie. KG, www.miele-professional.com | **Project management (responsible):** Johannes Baxpöhler, Nadja Lüdke | **Production:** TERRITORY Content to Results GmbH, Carl-Bertelsmann-Str. 33, 33311 Gütersloh, Tel.: 05241 23480-50, www.territory.de | **Publication manager:** Julia Lempe | **Implementation:** Editors: Sascha Otto (responsible), Stephan Kuhn | Graphic design: Sebastian Borgmeier, Claudia Kuhn | **Printing:** Bösmann Medien und Druck GmbH & Co. KG, Ohmstr. 7, D-32758 Detmold | **Photo credits:** AdobeStock: rootstocks (P. 1), Alex_Traksel, Kpdmedia, zinkevych (P. 6–7), amnaj, New Africa, Ortis, Vera (P. 12–13), Arlenta Apostrophe, Coprid, tashatuvango (P. 14–15), 3D generator, Alina, francescoridolfi, frimufilms (P. 18–19); Felix Carros | Siegen University (P. 3, 16–17); freepik (P. 3, 14–15); Icho (P. 3, 14–15); Miele (P. 2, 11); ThermoTex/Francine Waldeyer (P. 12–13); Thorsten Scherz/TERRITORY (P. 3, 8–11, 12–13, 20) | **Publication:** Spring and autumn



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Care goes digital, OAPs too

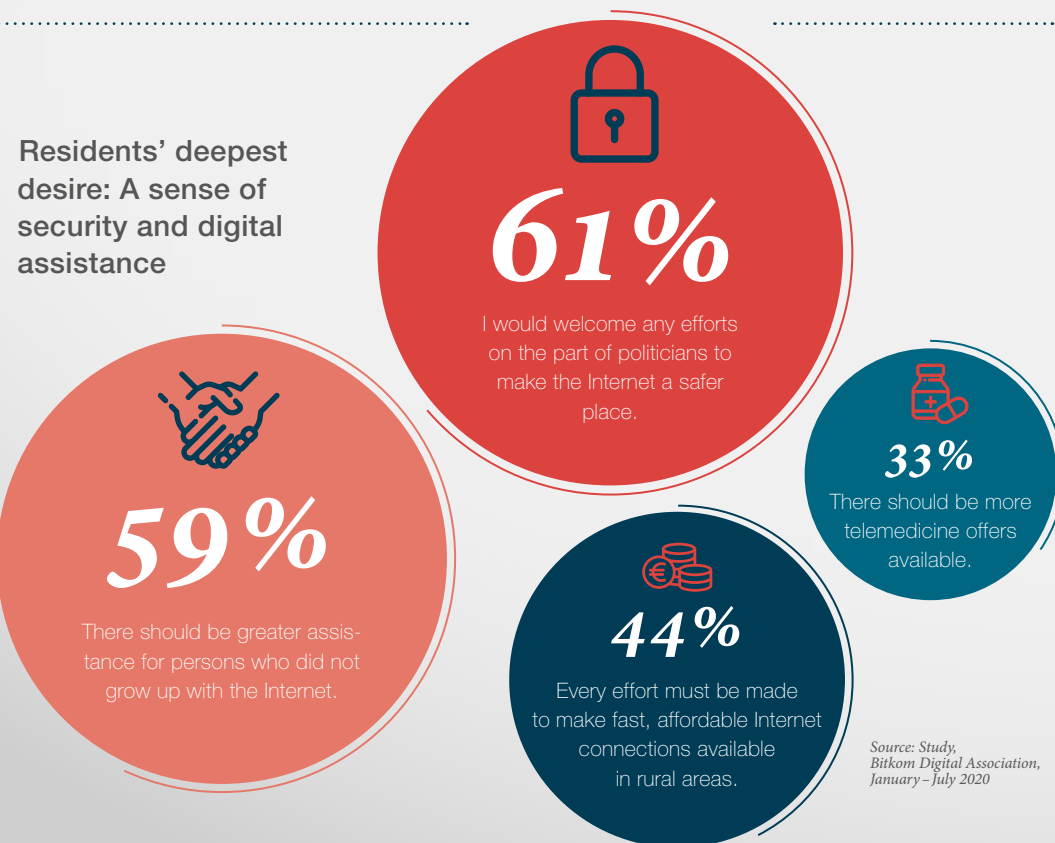
The world is in urgent need of care. More and more individuals needing care on the one hand; fewer and fewer carers on the other. Digitalisation has a key role to play in the care sector. But what is the position of stakeholders on the issue of digitalisation and what has happened over recent years? Surveys and studies provide glimmer of hope.

The elderly

So the elderly are sceptical towards digitalisation and new technologies, you say? Well, the picture has changed significantly over recent years. An increasing number of older persons now want to actively participate in today's digital society. But to what extent has the Covid pandemic accelerated this development? And how broadly accepted are digital aids in institutional care?

“Around 41% of Americans would be interested in a robot as a care worker for themselves or relatives if they had the chance.”

“On average, 45% of EU citizens aged between 65 and 74 used the Internet at least once a week in 2016; three times more than in 2007 (13%). Front-runner: Luxembourg (84%), Denmark (81%) and Sweden (80%).”



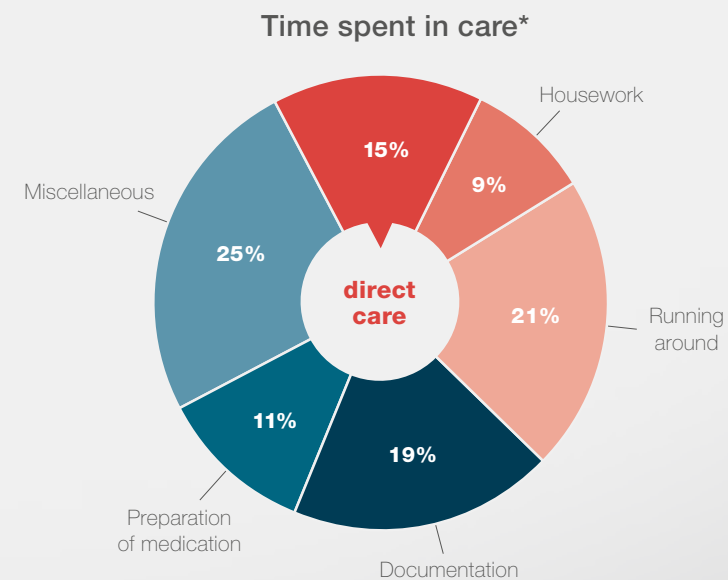
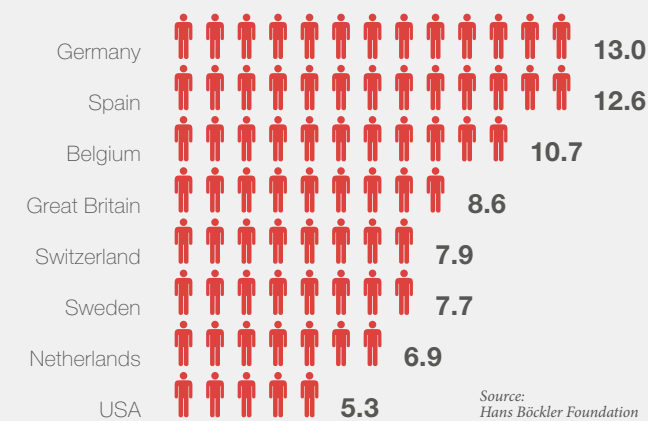
Care workers

Digitalisation in the care sector is coming on in leaps and bounds. A lot of catching up has gone on, particularly over recent years. Above all, electronic records have increasingly become the standard. Other technologies must undergo further development and trials before they become commonplace. Above all, robotics and assistance systems promise great potential for freeing up more time for the care of residents.

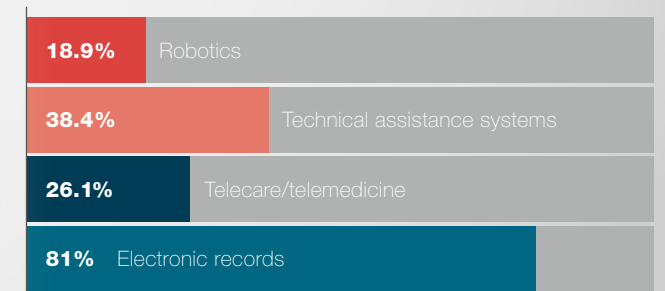
“Ask a carer what is most lacking in their work and the most likely response is not money but time. The reason is the increasing burden of work spread across fewer shoulders.”

German care workers stretched to the limit

Residents and patients per care worker in hospitals by country in 2018



Use of four focus technologies by work area

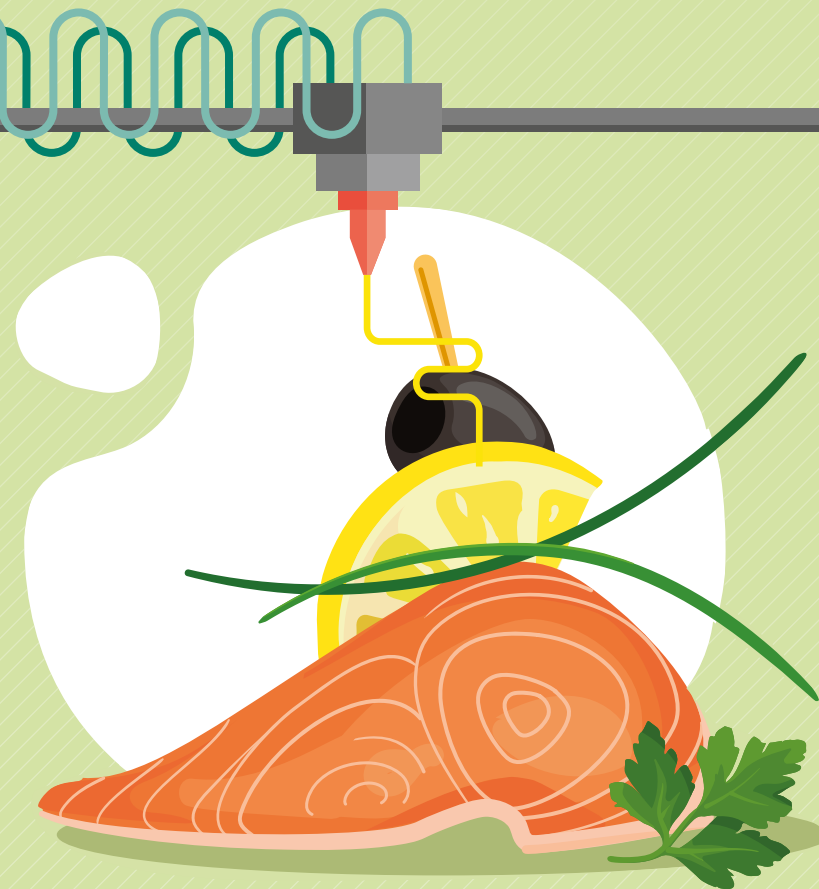


Source: Study, Healthcare workers' health and occupational safety mutual insurance association (BGW), 2018

“Red tape in healthcare is perhaps the biggest challenge in implementing digital technologies.”

COMBATting MALNOURISHMENT WITH TECHNOLOGY

Freshly served (by the printer)



Anything, just not run-of-the-mill food. New concepts in food technology are set to help prevent malnutrition in care and nursing homes. The idea: puréed food designed to look like a full meal. The chef? A 3D printer!

Lunch at the nursing home. Daily routine for residents. But not everyone looks forward to their meal. Although, today, there's supposed to be a new dish on the menu. All plated up: a complete menu with salmon, potatoes and carrots – at first glance, a very appetising meal! At the latest, the second mouthful reveals something special: The food has the consistency of mash. Hardly surprising as this reconstituted food originates in a 3D food printer capable of mimicking a wide range of dishes. Fresh from the printer, so to speak. This so-called 3D food, referred to as texture-modified by the experts, is still at the developmental stage in the care sector. Researchers across the world are addressing the issue of how food can best be adapted to the needs of the elderly. It would be a major breakthrough: Residents with difficulties chewing and swallowing are reliant on their food being blended or liquidised. In many cases,



WILL 3D PRINTERS REVOLUTIONISE COOKING? Printers are already able to represent complex forms and reproduce the consistency and texture of foods. Food printing was invented by NASA and developed as a way to feed astronauts on space missions. Since the early days, the technology has undergone continuous development and will presumably make inroads into consumers' homes in the near future.



“Visually appealing menus whet the appetite and are full of nutrients.”

this results in being served a greyish non-descript mash. As a result, those spoon-fed this way tend to eat less and hence take in lower quantities of nutrients and calories. According to estimates, up to 40% of residents in care homes suffer from these and similar symptoms. 3D food could possibly revolutionise the care of high-maintenance patients in future.

Superfood delivered to plates at the touch of a button

OK, that's enough theory for now. But how are things coming along in practice. In Germany, tests performed by the food technology faculty at the Weihenstephan technical university and the Institute of the Biomedicine of Ageing in Erlangen give reason for hope: The optical impression of printed food appears authentic enough to whet the appetite. Elderly patients

ate considerably more, with researchers in some cases even recording a gain in weight in their cohort. Direct and close contacts to nursing home canteens is particularly important at this stage of development. After all, they are the ones who know which foods meet with a favourable response. Working together, typical nursing home recipes are drawn up and tailored to the needs of a 3D printer. Also, the composition of nutrients and proteins is optimised to contain as many calories as possible. Practical: The printed menus can be deep-frozen after production and reheated in a microwave oven. Just how easily these devices can be integrated into processes in a nursing home kitchen is currently the subject of evaluation by researchers. For ongoing development work on food printing, we refer to the following website: www.enable-cluster.de //



ZOOMING AWAY THE DESIRE FOR CONTACT

An increased workload for staff and isolation for residents – Corona deals a hard blow to institutional care. But there are positives: Tablet PCs are suddenly in the sights of the elderly. And video-telephony is the order of the day.

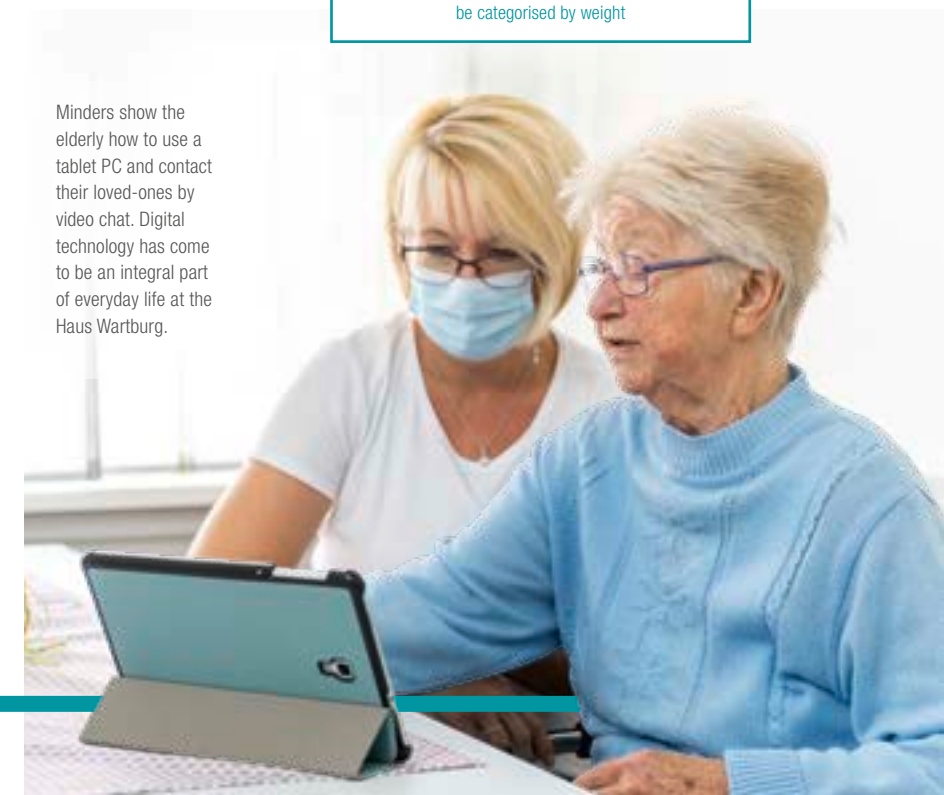
There are days in one's career that are simply unforgettable. For Doris Czok, housekeeping manager at the Haus Wartburg care home, it was a day just before the official Covid lockdown in Germany when the home's management decided to batten down the hatches to protect its residents. Suddenly, all hell broke loose. Families faced each other at a distance. Separated by a transparent protective screen. Elderly residents waved to their relatives – daughters, sons, grandchildren. More was not allowed. It was clear to all: We were caught up in a state of emergency. We were actually supposed to be marking an important anniversary. The Haus Wartburg was planning a large summer festival on the occasion of its 60th. year in business. Doris Czok had been working in the nursing home for 15 years. But there was no chance of celebrating in style.

The chief housekeeper: "It was surreal. No-one was prepared for a situation like this. I knew immediately: It's now all down to my team".

Digital caresses

Above all, it was the early stages of the Covid pandemic that kept Doris Czok on tenterhooks. Something unprecedented happened in her rural area: Staff and residents in a nursing home contracted Covid-19. Fifty died of the virus. The Wartburg acted swiftly to put measures in place to protect against Corona. Doris Czok is also responsible for supplies and stock levels. Every single piece of PPE, every mask counted. But then came the sobering realisation that the market had been swept clean. There were bottlenecks in procurement. The cost of materials shot up. The asking price for a packet of nitrile rubber gloves that usually cost € 5.20 hit € 14.

Minders show the elderly how to use a tablet PC and contact their loved-ones by video chat. Digital technology has come to be an integral part of everyday life at the Haus Wartburg.



FACTS AND FIGURES

112

residents

are cared for by the church-run Wartburg age-care facility in Lehre (Lower Saxony).

2

barrier washing machines

and two dryers

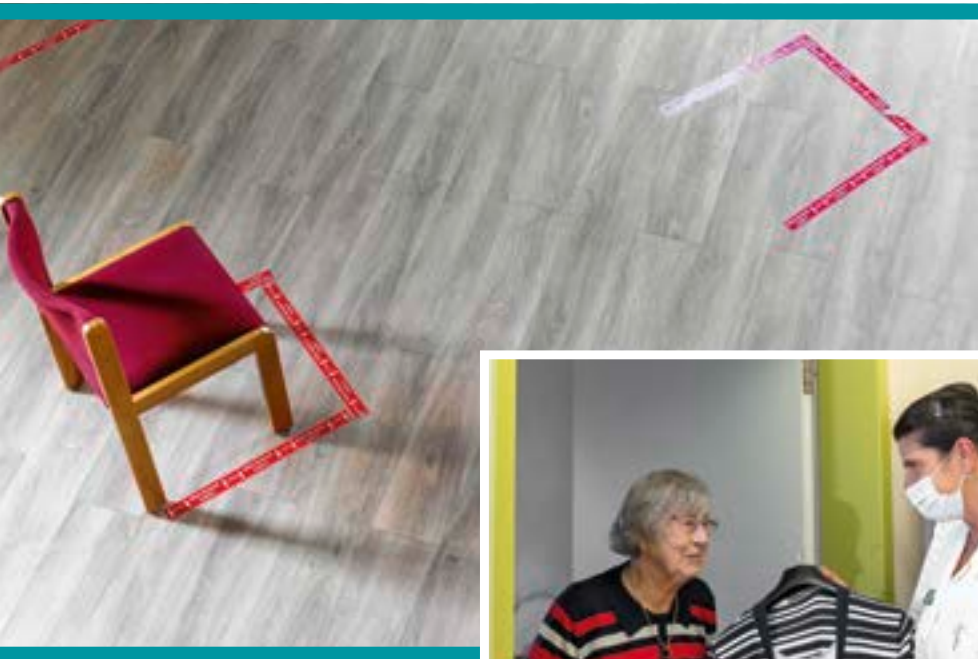
(each with a load capacity of 32 kg) are in daily use.

2,000

kg of laundry*

pass through the hands of the housekeeping team each month

*600 kg of delicates such as pillows, woollen blankets and quilted duvets which cannot be categorised by weight



Social distancing and hygiene characterise life at the Haus Wartburg care home. A gleam of hope for residents: Laundry is washed in-house again at long last. The quality of laundry care is a major factor contributing towards a sense of well-being.

“We had one suspected case. All the necessary measures were implemented immediately. Tensions ran high. Luckily enough, the test proved negative.”

Improvisation was called for: People from the local community set to work, sewing masks. Better than nothing. The manageress convened daily meetings with her staff. She remembers: “There were new regulations issued every day. Good communication was of the essence. I wanted to take a hands-on approach to ensure that no-one succumbed to the pressure they were exposed to.”

Light in the darkness

The team kept a level head and relied on its wealth of expertise. “We had been awarded a seal of approval for hygiene, Stage 2, and were forearmed to deal with extreme cases, such as a MRSA outbreak. We knew the measures to be taken and the processes to be installed. That gave us a sense of security”, says Doris Czok. But the workload was heavy, above all the set-up times. The never-ending disinfection of contact surfaces, the documentation ... And always that nagging feeling: The Coronavirus out there is an existential threat to our business.

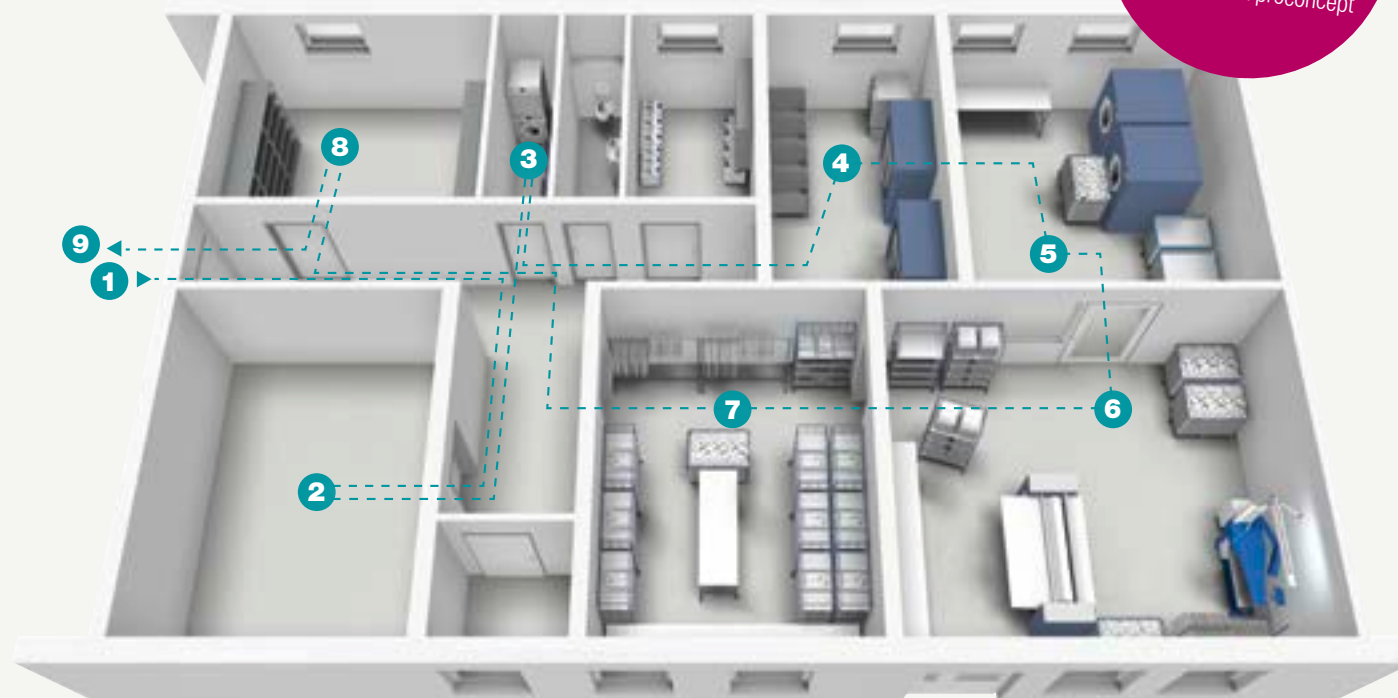
And everyday life in the home? It had most certainly changed. No visitors, most activities for residents cancelled. The dining room divided into two areas, tables dragged apart. Convivial gatherings a thing of the past. But there was a ray of hope: A donation provided the home with tablet PCs. Doris Czok recalls: “Our minders showed the elderly residents how video-telephony works. One resident was moved to tears at the ability of such a slim device to beam her straight into her daughter’s living room. Demand for slots was exponential. Hardly surprising: Technology is an antidote to loneliness. Today, several of these silver surfers are able to handle video apps such as Zoom without assistance.

Unsung heroes caress shirts

Isolation hones the senses. The renovation of the home’s kitchen couldn’t have come at a worse time, right in the middle of the pandemic. Work on water pipes and dust from construction work forced the housekeeping team to contract out their laundry. “The quality of laundry care was

ORDERLINESS is the precursor of cleanliness

Detailed descriptions of all processes are available online. www.miele.de/proconcept



- THE LAUNDRY CYCLE**
- 1 ACCEPTANCE POINT FOR SOILED LAUNDRY
 - 2 STORAGE OF SOILED LAUNDRY
 - 3 MOPS AND CLOTH WASHING
 - 4 UNCLEAN SIDE
 - 5 DRYING
 - 6 MACHINE AND HAND IRONING
 - 7 FOLDING AND SORTING
 - 8 STORAGE OF CLEAN LAUNDRY
 - 9 TRANSPORTATION

simply different. We stroke out shirts by hand when we iron them. And that makes a difference big enough for the residents to notice”. Recently, the Wartburg resumed their on-premise laundry care. And residents are full of praise again. The housekeeper is fully aware that laundry adds to the quality of life; “Feedback shows us that we are making an important contribution. And, quite generally: Care is always associated with hygiene. We would love to see this recognised in the Corona debate just as much as the services provided by care workers”. Important food for thought in memorable age. //



THE DIGITAL LAUNDRY

WHEN DATA HELPS WITH LAUNDRY CARE

Digitalisation has arrived in hospitals, care homes and on-premise laundries. And is helping to make processes more efficient, safer and tailored to individual needs.

Digitalisation always comes into its own where large volumes of data needs to be gathered and processed in a bid to optimise processes, make better use of resources and hence cut costs. This makes care and nursing homes ideally suited to become early adopters. In the Internet of Things, real and virtual worlds merge in the fusion of machines and services. In laundries, too, processes can be simplified, applications made safer and hygiene standards optimised. This starts with the digitalisation of laundry planning, deploying digital tools and methods. It has now reached the stage where 3-D room planning programmes and VR software open up ex-

citing new opportunities to realistically experience buildings, products and scenarios. Based on these plans, it is possible to gain an impression of the machines used in a laundry and to precisely gauge capacity and economic feasibility up front. This helps decision-makers to clearly identify the potential savings and benefits of a new on-premise laundry.

Washing machines with in-built intelligence
And the latest generation of machines has also taken digitalisation on board. Connectivity facilitates quality control and allows data to be evaluated on a permanent basis, making the design of the entire textile

hygiene process transparent and efficient, and customising processes. Fully automatic dispensing systems are geared to the needs of facilities, simplify work in the laundry thanks to customisable programme controls, and reduce consumption. Sensors detect and record the laundry quantity and adjust the consumption of resources to the load in hand. Machines with their own hygiene and disinfection programmes help to raise hygiene standards, save time and relieve staff. Customised calculators assist with manual dispensing and the creation of detergent plans. Automatic notification when detergent needs replenishing reduces administrative effort. In the dryer, sensors

constantly measure and monitor the degree of drying. This guarantees spot-on drying results whilst at the same time cutting costs and protecting textiles.

Pre-emptive maintenance

The diagnosis data logged by the machines enable the precise control and forecasting of machine utilisation levels, and provide information on faults, energy consumption and aborted wash cycles. This helps pinpoint potential for improvement in the laundry and even provides a platform for remote servicing. Thanks to digital technology, notifications of faults are sent straight to the technician who is updated even before the laundry becomes aware of the situation.

PLANNING

The progress of digitalisation allows homes to adapt and adjust their processes and better customise them to individual needs.

Predictive maintenance, a core component of Industry 4.0, plays an increasingly important role in after-sales service. This farsighted approach results in the proactive, pre-emptive maintenance of machines and equipment with a view to keeping downtimes to a minimum. The process uses measurement and trouble-shooting data captured by sensors.

Intelligent laundry

In laundry logistics, too, intelligent solutions and powerful identification systems are used – starting with laundry distribution software through to barcode labels and RFID transponders from suppliers such as THERMOTEX. RFID near-field technology allows items of laundry to be tracked and traced using attached transponders. Each garment fitted with an RFID chip is given its own unique and discrete ID number. Using a database, the history of each individual

laundry item can be called up and garments can be clearly assigned to their rightful owners. The entire inventory of tagged laundry items guarantees full transparency and cost savings as the number of non-retrievable items is cut drastically. WaschSoft from TransferTech goes even further: The programme was designed specifically for laundries and has a range of functionalities which reflects the entire gamut of core processes and also offers documentation and goods traceability. The software helps in processing and scheduling laundry orders and also supports the use of barcodes and transponders. An individually programmable 'laundry keypad' – similar to a cash register for product groups – simplifies and speeds up order capture. In addition to this, the software enables the management of consumption and the documentation of completed wash processes. This makes it possible to furnish proof of successful disinfection.

These solutions are not only to the benefit of care homes and laundries. Residents, too, profit from them: Particularly persons suffering from dementia become attached to their own personal garments as they provide an increased sense of well-being and belonging. This way, digital transformation and the associated technology helps people, be it residents or carers. //

TRANSPARENT

Thanks to attached RFID transponders, the path taken by every single item of laundry can be tracked and traced with precision so that their whereabouts are known at any given time.



Smart helpers for carers

Apps, gadgets and online offers enrich the lives of care-home residents, take work off the hands of carers and support those in positions of responsibility. Here are eight smart tips and tricks:

EASY-TO-USE APPS

1 // The **Care App** available from the German Medical Computing Centre is software for carers on the go. This app provides access to work rotas, appointments and visit schedules as well as timekeeping, care documentation and document capture. www.dmrz.de/software/pflege-app

2 // The **Care Report** app from the M4Telematics Group supports the paperless capture and documentation of the services provided by carers. This involves the use of an NFC chip in each room in a care or nursing home which logs carers as they enter and leave in order to record their work. The associated app logs and documents the care work performed. www.pflegedienst-personal.de

3 // The start-up **Voize** has developed a digital assistant for care-related documentation which allows care workers to use their smartphones as dictaphones. Voize's automatic speech recognition automatically generates structured entries in the care documentation ledger. Speech input and text analysis can be performed offline on the device. This benefits homes without blanket WLAN coverage. <https://voize.de>



The Memory Trainer

'Auguste' allows carers and relatives to train the brains of patients in a playful but therapeutic manner. The app offers eight pre-installed games with varying levels of challenge for dementia sufferers as well as allowing the integration of photographs from the lives of patients.



Digital shopping assistant

The online shop **bringliesel.de** helps residents to access everyday provisions, relieving carers of the time-consuming job of shopping for convenience goods. Items are delivered in individual bags with the names of residents. www.bringliesel.de



A never-ending source of ideas

The **Dementia Tablet** from Media4Care promotes family contacts, provides entertainment and offers more than 700 exciting videos, games, music and age-appropriate exercises to promote recollection and stay fit. The **Carer Tablet** includes six pre-installed apps with special-purpose media such as songs, videos and texts to occupy minds and help the elderly stay active. This helps create an entertaining and diverse care environment. www.media4care.de/betreuer-tablet



STAY FIT

Korianfit, a mobile interactive fitness device, increases mobility. A camera captures movements as elderly residents do fun exercises using a large screen. Users can select from a large number of games which promote concentration and mobility.

More information:
www.korian.de

Versatile companion

Some digital products have stood the test of time and never fail to delight – such as the prize-winning **ichó therapy ball**. In the context of care, this aid helps improve motor skills and recollection ability. Various applications are included to cover everything from biography work, memory training, motor skills and music therapy. Things happen as soon as a resident takes hold of the device. The gadget plays music, reads stories, supports memory, plays guessing games and is an open invitation to participate actively. <https://icho-systems.de/de/therapieball>



EVERYDAY COMPANIONS

Sport, singalongs, memory games: Social robots still largely offer fun and play to lighten up the everyday lives of care home residents.

“Robots create space for individual care”

Does the future of care lie with robots? Felix Carros, scientist at the University of Siegen, says: There is a lot of hype surrounding robots and they are often overestimated. His experience with socially interactive robots in care homes shows clearly that robots complement the human touch. And they have the potential to simplify the daily work of carers. They will never replace them, though.

ABOUT THE AUTHOR



Felix Carros works at the University of Siegen's Institute of Business Informatics and New Media. The focus of research: His use of socially interactive robotics in care. In constant dialogue with care workers, his goal is to identify the best possible applications for robots.

But what are robots capable of in the context of care? What types of robots are there?

The situation is quite varied. I, for example, am currently working on a social robot which tries to interact with its counterparts. Then there's the field of telepresence: In this case the robot is essentially a set of wheels with a telescopic stick holding a tablet. This makes more sense than ever in the age of Corona. A robot can help to make contact with the outside world, for instance with doctors or relatives. Another option would be a transportation robot to carry laundry baskets or deliver meals.

It all sounds very promising. So what's the downside?

All robots are isolated applications. Each robot is specialised and trained to perform one task, but there are none that can do everything. The big question is: Does it make sense? And: Is it economically feasible? One example from Japan, the Robo-Bear, which helps patients out of bed, reveals that low unit sales make robots very expensive in procurement.

What is the job of the type of robot you have programmed?

Our robot is deployed in prevention. It encourages the elderly for example to exercise. It plays music, presents the moves and invites residents to participate. It can serve a group of up to ten residents. Even simple cognitive training is conceivable. A form of the memory game for dementia sufferers, for instance. Or singalong sessions.

And are robots accepted by care home residents?

It is still too early to say. But it does appear that humans are able to strike up a relationship with robots. Here's an example: In one care home, we had to replace one of the robots after a while. We soon noticed that the residents didn't want any other robot than their 'Paula' – that's the name they gave her. Residents simply weren't willing to let go of their robot.

NO GROUNDS FOR FEAR

The elderly usually get used to robots fast. A child-like appearance can be an advantage. Felix Carros does warn though that ethical issues may also need addressing.



“Care workers should decide for themselves where robots are deployed. That is the only way to achieve sustainable results.”

How useful are robots from the point of view of care workers?

I am currently conducting a study on the subject. We are issuing robots to carers and letting them decide how they are deployed. This is the only way to ensure robots become an instrument in care and contribute to social welfare. That is the only way to arrive at sustainable results.

What are robots capable of in the care setting? Is there a trend?

We are noticing that robots are certainly seen as being useful. But we also realise it is a process. The mere mention that trials of robots are due to start triggers the fear for jobs. Once staff has had the opportunity to get to know the robots and see how they are used, attitudes change quite fast: "They are not that intelligent after all and could never do my job. But they can free up time for other things". Time for personal interaction. Our data supports this impression: The social interaction of our robots does not result in net time savings. It is more a matter of being an additional offer which creates space for individual care. The objective for the future must be to put robots to even more effective use. For example, equipping robots with good navigation so that relatives can be taken to residents' rooms without taking up carers' precious time. That would be a real help. //



INTELLIGENT TOGS FOR EVERYDAY USE

CLOTHES MAKE THE MAN ... SAFER

Most consumers are familiar with wearable computer systems which use sensors to gather and process data from smartwatches and running apps. Smart clothes are also wearable in the truest sense of the term. They are available for the broadest range of applications: Smart sportswear uses woven-in biometric sensors to measure the wearer's pulse, whilst yoga leggings use integrated sensors to check that poses are properly performed. Xenoma, wearHEALTH, a research group at

the Technical University of Kaiserslautern (TUK) and the German Research Centre for Artificial Intelligence (DFKI) go one step further by combining smart clothes with motion-capturing technology. Wearable sensors can be easily adapted to cater for various applications in sport, healthcare and industry. This opens up a wealth of applications in the fields of rehabilitation, sport and occupational safety and everywhere where detailed and robust tracking of motion is of value.

UNASSUMING, YET SAFE

SENS FLOOR: SMART, SENTIENT FLOORING

Technology is always at its best when it serves its purpose unobtrusively and blends in seamlessly with everyday activities – such as SensFloor intelligent flooring which affords the elderly greater security and convenience. Thanks to numerous integrated sensors, a person's position and movements are recorded for analysis. This is of benefit in prevention, emergency aid, activity monitoring and control: From switching on lights automatically as soon as a person enters a dark room through to switching off potentially dangerous devices on leaving a room. Should a person fall and not be able to get up again without assistance, floor sensors can trigger an emergency call. www.technik-zum-menschen-bringen.de/projekte/sensfloor

GROWING DEMAND FOR AGE CARE

Sharp rise in interest in carer training

Despite the challenges of the job, care professions appear to have become an attractive choice for an increasing number of people over recent years. As per the German Office for National Statistics for the end of October, 71,300 persons started an apprenticeship in the care sector last year. That figure equated to an increase of 8.2% or 5,400 compared with the previous year. Amongst these vocational courses, age care with its 41% increase showed the biggest rise in the number of people entering the profession. The proportion of men has grown over the past 10 years: Compared with 19% in 2009, the share grew by 2019 to 25%. Around 44,900 successfully completed their training in the care sector last year.



WHEELMAP APP

Freedom from barriers



85

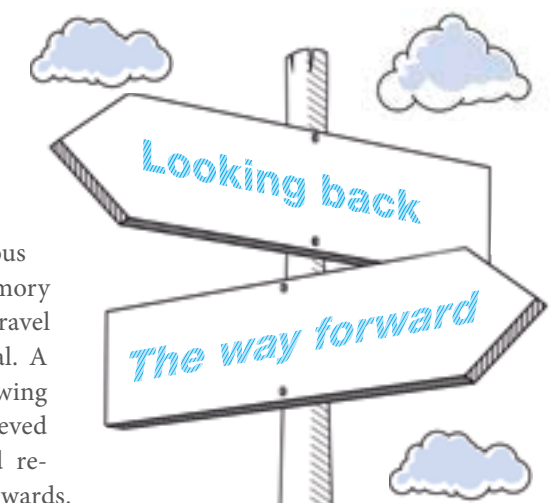
NO. OF PEOPLE IN WHEELCHAIRS IN MILLIONS (ESTIMATED)

Persons with restricted mobility can often even master their day unaided. But a single step can be an insurmountable obstacle for a wheelchair. All the better therefore if it is known in advance whether localities and premises are barrier-free. This is where Wheelmap, a plan for wheelchair-friendly environments, comes in. These can be found, entered and evaluated using a traffic-light system on www.wheelmap.org – worldwide. This interactive map has been available since 2010 and helps those affected to better plan their day. Currently, more than 1 million cafés, libraries, swimming baths and other places accessible to the public have been logged and assessed. And every day, new entries are being added by the hundreds. Wheelmap.org

is a global project and accessible around the world. Wheelmap is available as a free app in 32 languages. This facilitates the use of the map 'on the go' from the convenience of a smartphone. Wheelmap.org is a project run by SOZIALHELDEN (Social Heroes), a group of committed individuals who have been jointly developing creative projects to highlight social problems and, ideally, to provide solutions. It is estimated that there are around 85 million wheelchair users worldwide, with the number of unknown cases thought to be three times higher. This is even discounting the number of elderly who use a wheeled walking frame and are faced with similar problems. Given demographic changes, it is to be expected that this figure will continue to rise. www.sozialhelden.de

Walking backwards aids recall

Something ambitious joggers all know: Running backwards improves coordination and running skills and trains calf muscles. Experiments, though, have revealed other positive 'side effects'. A curious phenomenon: There is no better way to embark on a trip down memory lane than by literally taking a step backwards. This 'mnemonic time-travel effect' is described by British psychologists in the 'Cognition' journal. A series of experiments on more than 100 test subjects led to the following conclusion: Walking backwards jogs the memory. Test persons achieved better marks in recollection exercises after walking backwards and responded with more correct answers than after sitting or walking forwards. It was also revealed that even imaginary movements aid recall.



SMART

NEVER TOO OLD FOR
NEW TRICKS

At the Wartburg care home, digitalisation has pride of place. The elderly avail themselves of digital offers and feel at home on the Internet. Here are some ideas and suggestions:

- 1 “Never too old for the web”:** Brochure issued by BMFSFJ and the Rhineland-Palatinate consumer protection agency with a wealth of useful information and links. www.bmfsfj.de
- 2 “A guide through the digital world”:** A brochure published by the German umbrella organisation of care and nursing organisations (BAGSO). <https://www.bagso.de>
- 3 Klicksafe.de:** EU initiative for greater security on the worldwide web (a collection of material on Internet security). www.klicksafe.de
- 4 Silver Tips – safe online:** Portal run by the University of Mainz and the MKFS Foundation for the safe use of the Internet, smartphones et al. www.silver-tipps.de
- 5 Silver Surfers – Safer online:** Education programme with free downloading of training content. www.silversurfer-rlp.de
- 6 Mobilsicher.de:** Internet portal by iRights with tips and tricks, background information and instructions on the use of mobile devices. www.mobilsicher.de