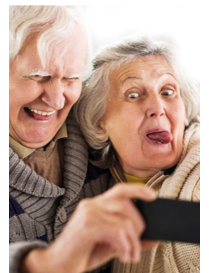
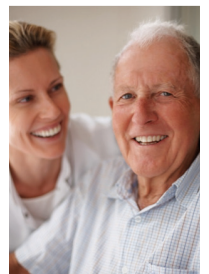
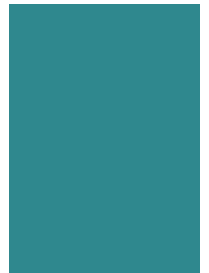


WHITEPAPER

Digital telecare: The need for a transition to digital systems and the associated opportunities and benefits

Why the technology enabled care industry is going digital
and what it means for users and service providers



ABSTRACT

The average age of many populations around the world is rising. With this age increase comes a greater burden on the organisations and individuals responsible for looking after older people.

Technology is also changing. The analogue systems the world has used for much of the past century are being overtaken by the opportunities of digital systems. This transition is not without issues – as the two systems are brought together there have been negative impacts on a wide range of technologies and resources that we are reliant on, including social alarms.

This article reviews the risks associated with the use of analogue social alarms and the opportunities presented by digital technology. As analogue social alarm systems do not integrate reliably with new digital infrastructures, people are at risk of not receiving the help they need, when they need it. It will explore how digital telecare systems offer reliability, efficiency and quality to service providers and their users, and how, by switching to digital systems we can ensure that older and vulnerable people enjoy living independently, more securely - for longer.



Figure 1 The trend of less young people to take care of more old people is set to continue

KEY DEFINITIONS

Alarm receiving centre (ARC)

A centre contracted to monitor and handle social alarm calls.

Local authorities

Covers local authorities/councils/municipalities/housing associations.

Next generation networks (NGN)

A digital network such as 2G, 3G, 4G, IP/broadband, fibre optic, etc.

Service providers

Supplier of telecare equipment and systems, and services in relation to the same.

Social alarms

Social alarms/carephones are alarm systems installed in the homes of older and vulnerable service users. When used they connect to the local authority ARC or a privately owned ARC.

Telecare systems

Typically, telecare services are provided through local authorities, housing associations, industry services and voluntary organisations and connect the user with an ARC if they need assistance. They include personal social alarms, a wide range of home sensors (e.g. fire and flood detectors) and activity monitoring.

DEMOGRAPHICS ARE CHANGING

The population as a whole is aging. People are living longer than ever before and younger people are having fewer children. Older generations are fitter, healthier and more independent than they have ever been. And with ever-advancing healthcare and services for older people, this is a trend that is here to stay.

Society has an aging dependency ratio. The ratio of working-age to old-age individuals is decreasing and there are less young people to care for more older people. For society, this has meant a transition in the way we approach care.

One clear focus for policy makers and local authorities is to try and keep older people at home for longer. Telecare systems give people access to independent living. However, analogue telecare systems are arguably taking us one step back. The decision by most major telecoms providers to switch their networks to NGNs means that the connection of analogue care alarms is no longer reliable. And if a social alarm fails to connect, the outcome can be a fatality that could have been prevented.

The key issues that analogue social alarms create for the care system fall, largely, under three main categories: societal issues, operational issues and functional issues.

Looking at the problems faced with analogue alarms clearly demonstrates the benefits and opportunities of digital telecare.

SWEDEN, 2007

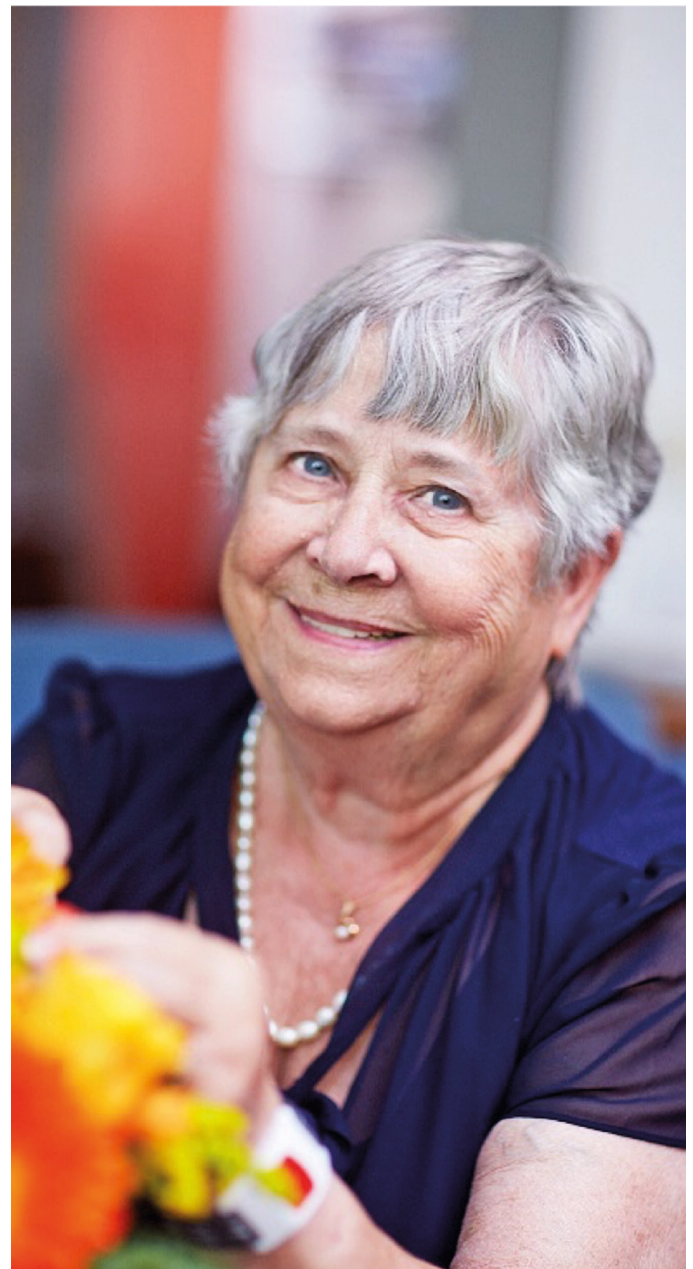
Swedish telecom provider Telia upgraded their core network to an NGN in 2007. Following this transition, a 76-year-old man died when his analogue social alarm failed to connect to the digital network via his analogue telephone line.

NETWORK PROVIDERS HAVE SET THE DATE FOR ANALOGUE SHUT DOWN:	
Swisscom	2019
Deutsche Telecom	2019
Orange France	2023
BT (UK)	2025*

*No more landlines to be installed after 2023

THE FUTURE OF TELECARE IS DIGITAL

The problems experienced when using analogue social alarms are, for the most part, a result of trying to use outdated technology with new infrastructures. Even hybrid solutions – analogue devices with digital interfaces – are not reliable enough and, importantly, they are not future-proofed. Digital telecare systems are built to work with NGNs and digital ARCs. They use only digital information to transmit data end-to-end, from the social alarm controller to an ARC.





SOCIETAL BENEFITS OF DIGITAL TELECARE

In Sweden in 2007 it was estimated that 20% of analogue alarm connections via an NGN failed. Commercial realities are pushing network providers to close analogue networks and final shut down dates are generally preceded by local closures – if local authorities do not switch to digital telecare solutions, connection errors will increase.

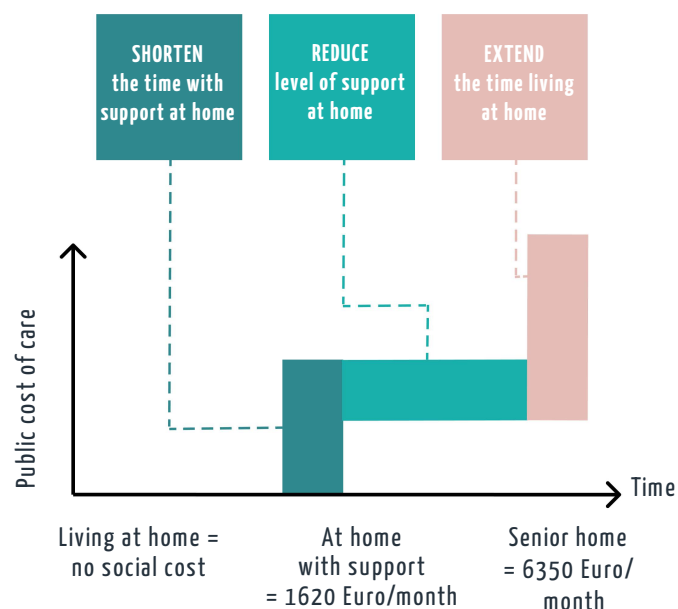


Figure 2 Digital telecare systems extend the amount of time people can stay at home and decreases the cost of support required from local authorities

Source: KOLADA (Official statistics government and municipalities, Sweden)

INDEPENDENCE AT HOME

With a failure rate as high as 20%, local authorities and service providers are beginning to question the reliability of analogue social alarms, and whether users are being put at risk by depending on them. New digital social alarms have a significantly higher connection reliability rate than analogue alarms and, most importantly, the connectivity status is visible. With regular online monitoring of digital alarms by service providers, local authorities can be confident that their social alarms are operating securely.

Digital social alarms are inherently reliable. So users have the confidence to trust them and remain living at home for longer and the financial burden on local authorities to rehouse them is reduced. Switching also saves money in the long run as digital systems are less expensive to maintain and support than analogue systems.

READY FOR THE FUTURE

Digital telecare is future-proofed. Not only are digital systems ready to adapt to the progression of technology, but they are also ready to deliver future services.

Digital telecare is a form of Technology Enabled Care. And it has the capacity and flexibility to support and provide digital health services such as advanced telecare, telehealth and connected care which, with the increasing ‘connectivity’ of the world, many see as the future of healthcare.

TECHNOLOGY ENABLED CARE (TEC)

Includes telehealth, telecare, telemedicine, telecoaching and self-care services that put people in control of their own health, wellbeing and support, keeping them safe, well and independent and offering them and their families peace of mind.

TEC also includes personalised sensors and apps that can support fitness, health, care and wellbeing for individuals and carers. Other terms used to cover TEC services include digital health, health IT, mHealth, eHealth, smart home technologies, artificial intelligence and internet of things.



CASE STUDY: USER EXPERIENCE



Kalmar municipality

Kalmar municipality have reported users that have greater control over their social alarms and connected sensors and alarms. They can rely on the monitoring system, knowing they will be notified if anything is wrong. This gives their users security and peace of mind.



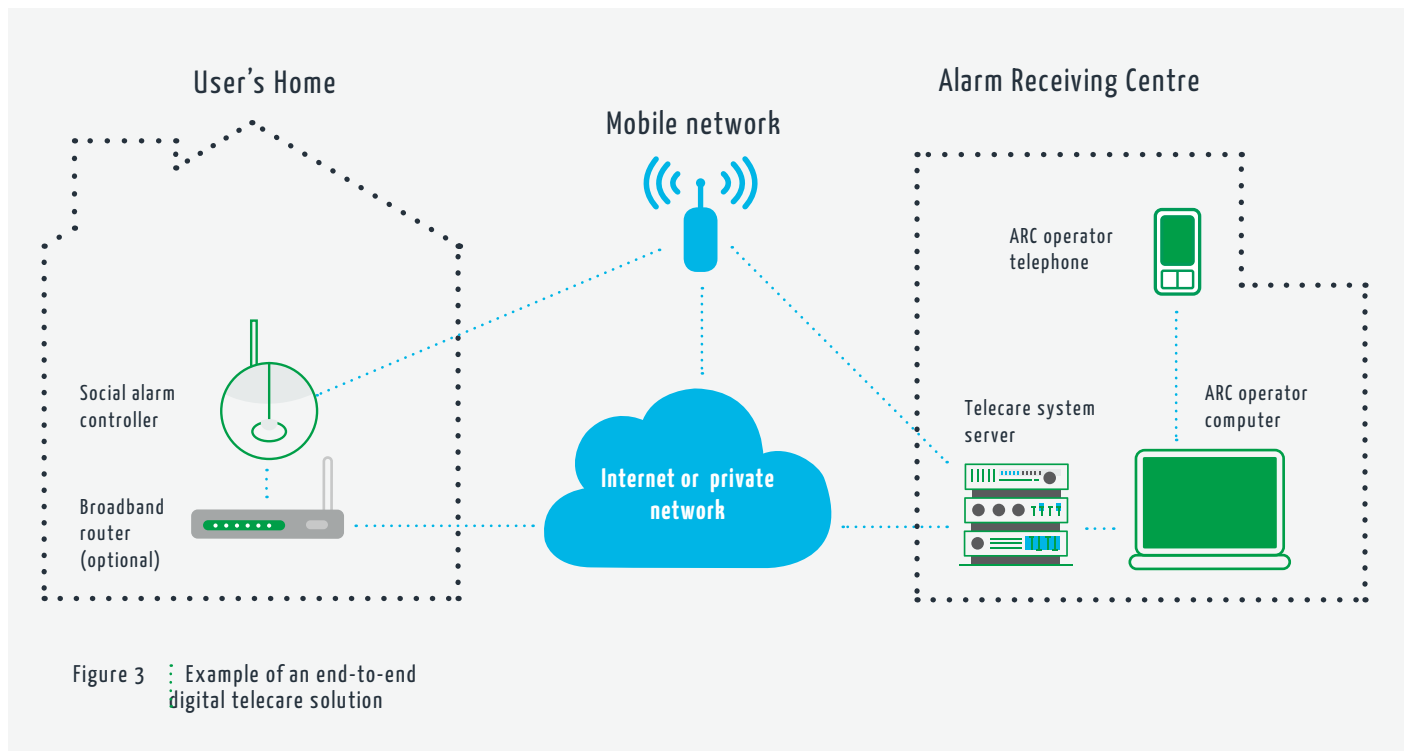
OPERATIONAL BENEFITS OF DIGITAL TELECARE

A SEAMLESS CONNECTION

Implementing digital systems reduces the risk of error and increases the security and efficiency of the system. Analogue systems are no longer being maintained by network providers and this means that local authorities and service suppliers have two options for social alarms. They can try and update existing analogue alarms to keep

up with new digital infrastructures or switch to fully digital systems. The Swedish Post and Telecom Authority has advised municipalities in Sweden that hybrid analogue solutions should be avoided, arguing that switching to digital is critical to ensure that alarm services are delivered, developed and function in a reliable manner for end-users.

It is also important that ARCs are converted to be fully digital. Many ARCs run, or employed, by local authorities still use analogue systems. When the network connection from social alarm to ARC is fully digital it will use a digital protocol e.g. SCAIP (social care alarm internet protocol) or Cenelec TS 50134-9 that are designed to provide information on the identity of the caller, the alarm type and the location – providing the ARC with immediate and secure data on each alarm call.



COST EFFICIENCY

The move to end-to-end digital solutions not only increases operational efficiency, it also decreases operational costs. Maintaining analogue alarms will become increasingly demanding for local authorities that are yet to upgrade to digital solutions. They need to be tested manually, and updated and modified to keep up with technology. Digital solutions, in contrast, are under constant online supervision and most modifications and software updates can be done remotely. By removing the need for physical visits by the local authority or service provider personnel, costs are cut.

Costs can also be reduced for local authorities as the need to maintain ARC locations 24/7, with multiple members of staff, is removed. In traditional analogue models, each local authority will either have their own ARC, or will outsource to a third party ARC. Digital cloud-based ARC services increase the flexibility that local authorities have to efficiently divide their resources. Firstly, they reduce the errors associated with signal conversion. Secondly, they give local authorities greater control over how alarm calls are routed, shared and responded to – taking into account effecting factors such as the time of day.



CASE STUDIES: COST EFFICIENCY



The Swedish Association of Local Authorities and Regions (SKL)

In the SKL's report, Nyttokalkylen, they stated that not implementing digital social alarm systems will lead to greater costs, both directly and indirectly for municipalities. Directly, continuing with analogue social alarms will increase the cost of supervising growing numbers of people in sheltered housing via telephone and personal visits. Indirectly, by not embracing digital care networks municipalities will see increased accidents in the home which will be more expensive to cope with given the inevitable rise in the cost of medical and community care.



Landskrona municipality

The Swedish municipality of Landskrona found that the adoption of a cloud based solution meant they could redirect out-of-hours calls to the ARC run by Careium. This freed up personnel who previously monitored alarm calls at night to be deployed as mobile response staff. The fully digital system, from alarms to ARCs, allows Landskrona municipality to provide a more streamlined and customer-focused service by offering more direct personal contact.



FUNCTIONAL BENEFITS OF DIGITAL TELECARE

KEEPING SYSTEMS IN CHECK

Analogue systems have limited communication with ARCs – they only connect when a call is made. This raises justifiable fears that malfunctioning analogue alarms will not be identified until it is too late. Digital systems, however, enable always-on-line communication between alarm devices in the home and the ARC – digital social alarm systems run status checks between the alarm device and the ARC as regularly as every two minutes. Which is far more regularly than the once a week or once a month check that is common for analogue alarms. If problems occur, they will be detected immediately.

In the same way as digital social alarms can be remotely monitored, they can also be remotely accessed for servicing and firmware updates – reducing the costs of visits by service personnel and increasing the efficiency of alarm servicing.

IMPROVING QUALITY

Digital solutions improve the call quality between ARCs and social alarms – they remove traditional interference via a reliable communication path thanks to no signal conversion. But digital connections have also been questioned. During early trials of digital systems, some mobile networks chosen for digital alarms were found to have limited connectivity in certain areas, which prompted



questions of whether digital alarms could really be relied on. This problem is resolved by taking the burden of sourcing SIM cards away from local authorities and placing it with the service provider. For instance, roaming SIMs designed specifically for machine to machine applications are supplied with all Careium digital social alarms. This means that the issue of connectivity for digital telecare systems is largely problem free, but in the event that there are connectivity issues, support is provided immediately – with no debate on who is responsible for resolving any communication issues.

AN END TO FIXED LINES

Finally, digital telecare systems solve an issue being faced by many service providers. Many older homeowners no longer have analogue phone lines at home. As the cost of fixed lines has increased year on year for end-users, more and more are switching to using mobile phones, often supplied by family members. Digital social alarms do not require a fixed line but need only a mobile network or broadband connection – meaning they can be installed virtually anywhere.

DIGITAL TELECARE – FOR NOW AND THE FUTURE

Digital telecare has enormous potential for the future of social alarms and healthcare. It is designed to integrate with new digital infrastructures and offers reliability, efficiency and quality to people around the world, giving them the freedom to live and enjoy their lives as they please.

It is ready to work alongside other TEC services and will be key to exploring new and innovative programmes, such as the increased administration of healthcare and medication via digital services and connected care.

But it doesn't just meet the requirements of new technology – it also ensures that older people can continue to enjoy independent living, with the peace of mind that help can be called whenever they need it.

Digital social alarms. Enabling more people to enjoy living independently and more securely – for longer.



SWEDEN: MAKING THE TRANSITION FROM ANALOGUE TO DIGITAL

When it comes to the move from analogue to digital social alarms, Sweden is leading the way. In 2007 there were multiple incidents reported where social alarms failed to connect to the NGN. This prompted the Swedish government to set a target for all social alarms to be digital by the end of 2018. In line with this there has been a consolidation of ARCs, with many municipalities outsourcing their service monitoring to a privately owned ARCs, including the Careium ARC. Careium has played a leading role in the transition to digital alarm systems in many Swedish municipalities.

All of the municipalities feel the transitions have been successful, and that working closely with Careium has meant any concerns each local authority has had have been taken into account and addressed during the process.



Borås municipality

Continuous monitoring of SIM operation is a big advantage over analogue carephones. Besides knowing that the carephone is connected to the server, it's also possible to get information regarding the alarm button connected to the carephone. Not needing a land line and having more flexible installation options is good. To be able to get an "all in one" solution is a big time saver.



Nyköping municipality

It brings a safer monitoring of the carephones and also the connection between the alarm button and the carephone. Also it makes it possible to program at distance which makes it possible to make updates immediately. When the customer pushes the alarm button the best network at that moment is used and different suppliers are available. The costs for the SIM cards are included in the monthly lease so therefore we have full control.