

Localization technologies (GPS)



Summary

Several of the municipalities that participated in the development phase of the Norwegian National Programme for Personal Connected Health and Care (NVP) have tested GPS solutions for locating people. GPS tracking solutions make it possible, if necessary, to locate the wearer or carrier of the GPS device. Different kinds of localization technology have been tested by the municipalities of Larvik, Skien, Oslo, Bergen, Stord, Bjugn, Bærum, Drammen, Trondheim, Åfjord, Sarpsborg, Vestre Toten, Søndre Land, Lyngdal, Sirdal and Kvinesdal.

NVP in Norway has recommended that this service is implemented nationally. This recommendation is based on the benefits from the development phase of this service.

Main effects of the solution

The documented effects of the trials in the development municipalities have been summarized in the First and Second Benefit Realization Reports with recommendations (Norwegian Directorate of Health, 2016 and 2017).

- **Qualitative benefits.** The most frequently mentioned qualitative benefits are an increased sense of security and freedom for service recipients, relatives and staff in the care service. For relatives and employees, security is associated with the certainty that users can be located if they do not find their way back. In Drammen municipality, 28 people have received the positioning service. The most important benefits have been increased quality of life for users and their relatives because users have a secure and more active everyday life, as well as enhanced social and mental stimulation. Users can also stay home for longer (Drammen municipality, 2016).
- **Freedom and absence of coercion.** For almost 70% of users in a survey in Larvik municipality, GPS means that relatives or staff do not need to divert or prevent a person diagnosed with dementia or cognitive impairment from going out. 70% of respondents in the Larvik survey also believe that there are less conflicts if users are able to go out when they want to (Ausen et al., 2016). The experience of Bærum municipality is that the use of localization technology is the least intrusive measure for certain users. Users who want and need to use localization technology would like to maintain their autonomy and freedom (Bærum, 2016).
- **Stay longer at home and postpone further services.** The majority, if not all, of the municipalities that have piloted localization technology have noted that service recipients can stay longer at home or postpone the need to start using other services. Skien municipality estimates that 15%–20% of users will benefit in the form of a delayed requirement for service escalation or placement in an institution (Skien municipality, 2016). However, documenting how long the needs of one complex disease picture can be delayed is challenging, and where localization technology is often a measure in combination with other measures such as home services and day-care services (Ausen et al., 2016).

Preliminary figures show that users in Larvik municipality postponed other services offered by the municipality for approx. three months (Larvik municipality, 2016). In Bærum municipality, several residents with dementia in the institution were able to remain longer in the open unit, where the alternative would be a sheltered department (Bærum municipality, 2016). Both Bærum and Larvik also reports on users who have been able to move home from institution using localization technology. Duration of resettlement has varied from a

few weeks to several months; a person who lived in a sheltered department for dementia at a nursing home in Larvik municipality still lived at home, four months after moving from the nursing home.

Drammen has drawn up an estimate based on eleven residents with cognitive impairments who had prompted search efforts before being supplied with location technology. They would normally have had to move into a care home. Bearing in mind how long they have continued living at home thanks to location technology, the municipality has produced estimates of savings per person, based on the price for a place in a nursing home (SEK 3,196/24-hour period) and spread over the relevant years. In 2014, the municipality expects to have saved NOK 2,109,360, i.e. NOK 124,000 per user. The anticipated number of users in 2016 is 28, giving a potential total saving of NOK 3,474,240 (Drammen Municipality, 2016).

- **Avoidance of search and rescue operations.** The municipalities' experience in providing localization technology confirms findings from earlier reports to the National Program for Welfare Technology and major trials such as "Trygge spor" and "Samspill". This service averts major search and rescue actions. There are no statistics on the number of annual search and rescue actions for people with cognitive impairment or dementia, but when the emergency services and voluntary work expire, society uses considerable resources on this. The number of avoided search and rescue actions averted in each municipality cannot be determined with certainty either. But Drammen municipality has made a calculation based on people who have previously triggered search and rescue actions and which have now received the service. The time is retrieved by the user being able to locate quickly via GPS and avoiding major search and rescue activities, and Drammen municipality expects to save 548 hours (0.32 man-years) in 2016 (Drammen municipality, 2016).

Users

Different kinds of localization technology have been tested by the municipalities of Larvik, Skien, Oslo, Bergen, Stord, Bjugn, Bærum, Drammen, Trondheim, Åfjord, Sarpsborg, Vestre Toten, Søndre Land, Lyngdal, Sirdal and Kvinesdal. The majority of these municipalities have received funding for testing from the national programme. The exception is Oslo Municipality, which has adopted localization technology for service recipients in dementia care as part of the "Samhold" project. Several municipalities have been involved in the SINTEF-led project "Trygge spor", which has conducted an effect study based on experiences from 19 municipalities and prepared a service model for how the municipalities can use GPS for people with dementia (Ausen, Svagård, Øderud, Holbø & Bøthun, 2013).

In the development phase of this service, 31 municipalities were nominated as development municipalities. Currently, 80% of the municipalities in Norway are included in activities supported by the National Programme for Personal Connected Health and Care.

Quotes/Testimonials

"A day without an excursion is a bad day."
– User, Larvik Municipality

Elaboration

Needs and challenges

We are facing a double demographic challenge. The ageing population's need for health and care services is increasing, while access to the workforce is declining. Digitalisation can be increasingly important for enabling municipalities to offer quality health and care services.

Solution and function

Different kinds of localization technology have been tested by the municipalities. In the past year, several of the municipalities have offered location technology as part of their rehabilitation service. For users with a mental retardation, virtual fences (Geofence) which issues an alert when users enter and exit a geographical area, provides great security and freedom to travel outdoors. This, in turn, has contributed to the increase in activation, which is a goal for many in this user group. Devices featuring two-way voice function can be useful, but not all users know how to use the function, it must often be used some time to enter into a dialogue. Finding technology that is reliable and has good usability is challenging (Søndre Land municipality, 2016).

Preparation

To ensure volume of the services, an important task is standardisation in order to ensure that personal connected health and care is implemented in Norway on the basis of internationally accredited standards. Other essential prerequisites to be solved to ensure the volume and success of this kind of service include good systems for the response service, procurement practice, integration of patient record systems, changes in mindset and, most of all, solutions that meet the users' needs.

Implementation

The Norwegian Directorate of Health, together with the Norwegian Association of Local and Regional Authorities (KS) and the Norwegian Directorate for eHealth run the National Programme for Personal Connected Health and Care (NVP). The overall goal of this programme is to ensure that personal connected health and care is made an integrated component of health and care services by 2020. The objective is to meet the municipalities' information and knowledge needs in order to facilitate broad use of welfare technology solutions.

From 2013 to 2016, 31 municipalities were included as development municipalities in the programme. Currently, in the escalation phase, 80% of municipalities in Norway are engaged in the programme. The NVP is providing a wide range of implementation tools and support to the municipalities engaged in the programme.

The tools and support offered by the programme comprise:

- National Recommendations
- Guidelines for service innovation and benefits realization management
- Guidelines for implementation: Roadmap and quick guide
- Courses in "Velferdsteknologiens ABC"
- Process support
- Conferences, workshops, seminars

Different kinds of localization technology have been tested by the municipalities of Larvik, Skien, Oslo, Bergen, Stord, Bjugn, Bærum, Drammen, Trondheim, Åfjord, Sarpsborg, Vestre Toten, Søndre Land, Lyngdal, Sirdal and Kvinesdal. The majority of these municipalities have received funding for testing from the national programme. The exception is Oslo Municipality, which has adopted alarm and localization technology for service recipients in dementia care as part of the "Samhold" project. Several municipalities have been involved in this SINTEF-led project "Trygge spor", which has conducted an effect study based on experiences from 19 municipalities and prepared a service model for how the municipalities can use GPS for people with dementia (Ausen, Svagård, Øderud, Holbø & Bøthun, 2013).

Economy

The price varies depending on the specific technology chosen. Cost-saving estimates have been made in some of the development municipalities. These are described under Effects.

Follow-up/monitoring

In order to scale the solutions in operation, in 2016 the development municipalities worked systematically on acquiring technology solutions, organizing the reception of alerts and implementing good procedures for training, follow-up and adaptation of technology solutions.

The municipalities have also worked systematically on profit planning, as well as identifying good measurement indicators for welfare technology, evaluation and documentation.

From 2017, the NVP programme entered the dissemination and escalation phase. The transition to operational phase can be critical. For some municipalities, the transition will be greater than for other municipalities as they have chosen different ways of implementing the new services. Some municipalities have chosen to utilise the technology solutions and set up the organization, adapted and further developed the service as more service recipients arrived. Others have chosen to set up and prepare the service for a high number of users before deploying the technology, which has required a lot of advance work. Regardless of which approach the municipalities have chosen, it is important that the transition to ordinary operations is considered early in the process.

Learnings and tips

In the development phase of the national programme, the municipalities have worked systematically on project management, service development, evaluation and documentation work, gaining expertise and general knowledge of personal connected health and care/welfare technology. These municipalities now have valuable expertise regarding opportunities and utility for end users, their relatives and the service as a whole.

Further information

- [Trygge spor](#) (PDF in norwegian)
- [About localization technology at Helsedirektoratet.no »](#)
- [Profit Realization Reports - National Welfare Technology Program »](#)
(PDF reports available for download)

Contact details

Rita Irene Johansen, rita.irene.johansen@unn.no

Context

The NVP programme in Norway highlights the realization of the effects, depending on the context and the individual municipality's service. Different municipalities will have a different potential for savings and the benefits in one municipality will not be transferable to another municipality utilising the same technology. This relates to how health and care services are organized, as well as resources and demographics. Every municipality must identify its own potential to deliver better and more efficient services.

If you want to succeed in introducing welfare technology, the municipality must succeed in changing the way services are delivered. Welfare technology must also be seen in the context of other user-oriented services such as everyday exercise and everyday rehabilitation, where relevant (health and the Ministry of Care, 2015). It appears that the municipalities that adapt the technology to their existing service have the greatest potential of gaining major benefits from welfare technology.

The use of localization technology in Sweden

Around 60% of all municipalities in Sweden use some form of GPS alarm or GPS watch and Östersund municipality serves as a good example. The municipality has many years of experience using this kind of technology and currently has approximately 350 GPS watches in operation. The number of watches is increasing every week. At first, they were mostly used for people diagnosed with cognitive impairment or some form of dementia but are now used for anyone who would like to be more mobile but still needs to feel safe.

Functionality can be tailored to each individual user. The alarm can be triggered manually if the user needs help but geofencing can also be used if a specific user stray too far away. Fall sensors can detect if the user has fallen and not been able to get back up, which will also trigger an alarm. The watches can also be set up so that the alarm is sent to a partner or relative, instead of going directly to the call centre.

GPS watches can give users a sense of freedom that could not be offered by a regular safety alarm, which only works in the user's home. A GPS watch can give the same sense of safety and works anywhere, enabling users to go out for a walk and still feel safe. Users can resume their social life without having to be confined to their own home.

The implementation has been successful and there is still a high demand for GPS watches. Östersund municipality has 1,650 regular safety alarms and it is estimated that more than half of them could be replaced by GPS watches in the future. However, users who do not need to be mobile and only use an alarm in their home should continue to use the regular safety alarm, as this doesn't require charging.

Apart from the obvious positive effects for the users, the limited municipal resources can be used where they are needed the most. GPS watches can be combined with other types of sensors, including door alarms and safety cameras.

Contact person

Åsa Trolle, Östersunds kommun, asa.trolle@ostersund.se

Service provider

Doro