Network collaboration within safety telephone services for ageing people in Finland.

Helinä Melkas, Ph.D.
Helsinki University of Technology Lahti Center
Saimaankatu 11, FIN-15140 Lahti, Finland
e-mail: helina.melkas@hut.fi

H. Melkas. Network collaboration within safety telephone services for ageing people in Finland. Gerontechnology 2003;2(4):306-323. **Objective:** This article gives an overview of information flows, networking, and collaboration within organisational networks providing safety telephone services to ageing people. As a corollary, the article produces practical recommendations. The article is based on a comprehensive investigation of operations of several different kinds of safety telephone service networks. **Methods**: The analysis was done on the basis of qualitative interview data. Interviews were carried out among service providers around the country in Finland and in one location in Sweden for comparison. The interviewees were representative of the different sectors, professions, organisations, and types of services within the branch. The investigation was directed towards all information and networking processes that are relevant for safety telephone service operations. **Results:** Several types of information are transferred within the service networks: customer -, alarm -, technical -, and network information. Bottlenecks of information flows are related, inter alia, to differences in local service structures and in service provision depending on time of the day, collaboration between the public and private sector service providers, and information quality. Network participants have undefined rights and responsibilities as well as unclearness about their role in the whole of safety telephone services. Initiation into network operations and continuous communication among network participants is often lacking. Building trust is essential in virtual networks of this kind, and it starts from how collaboration is defined, initiated, and structured. **Conclusions:** Special attention needs to be paid to information flows and network collaboration within the multi-layered context of safety telephone services. There is a need for improved network consciousness among service providers. Only after the problems in information transfer and networking have been solved, new service development becomes feasible.

Keywords: safety telephone services, network collaboration, information flows

A safety telephone increases the possibilities of an ageing person to continue to live in her or his own home. Ageing people often wish to live at home as long as possible and safety telephones are part of today's structure of elderly care in Finland. Feelings of insecurity and fear are among the most common reasons for moving into a block of service flats or an old-age home. The use of safety telephones has increased in private homes, but they are also utilised in institutional settings to facilitate the work of care personnel.

There are some 70,000 safety telephones in use in Finland today. They have either been acquired by private citizens at their

own expense or provided by the municipality as part of public service provision. As the population is ageing rapidly, it is expected that the number of safety telephones and the need for related services will increase explosively within the next decade or so.

In Finland, the system of safety telephone services is highly fragmented. Services are offered by private enterprises (at specific geographical areas or nationally), municipalities, non-governmental organisations, co-operatives, and foundations. The call centre that receives alarm calls may be a tiny internal unit in an old-age home or a large centre that serves thousands of customers from all over the country, or something in between, such as a municipal call centre. Those providing the actual help may be employees from municipal home care services, private enterprises offering care services, or even taxi drivers, depending on the locality and hour of the day (Figure 1).

The present article focuses on information flows as well as networking and collaboration principles and practices of safety telephone service networks. There is a need to investigate and develop these matters within heterogeneous multi-actor service networks, as they have rarely been studied. Increasing variability in safety telephone services in terms of service providers, appliances, and types of services also highlights the need to pay detailed attention to the service system of safety telephones. The article answers the following two questions: (1) What are the information flows in the networks and what kind of information is being transferred? (2) How does collaboration in the networks affect information flows – and vice versa?

Enterprise networks and information management systems are widely studied fields, but there is only limited understanding of the information processes of networks of public and private service organisations in the literature. Virtual organisations, virtual enterprises, and virtual teams within enterprises have been much studied in the last few years (for a review, see[1]). However, the kinds of multi-actor service networks that are discussed in the present article have barely been investigated. Some work has been done to assess effectiveness of public-sector service networks[2], but without including information-related matters. Little work has been devoted to the requirements placed by the utilisation of well-being technology on information processes, information quality, and networking

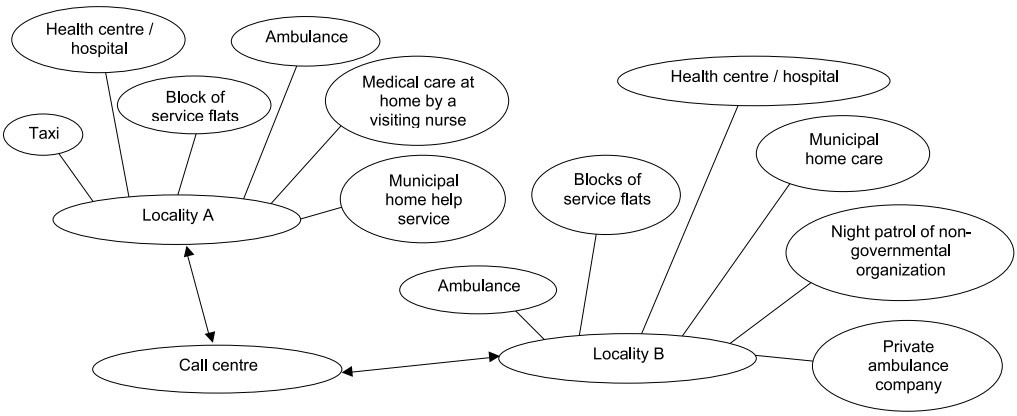

Figure 1. Examples of local collaborators of a large call centre for safety telephone services

among different types of organisations – despite the growing societal weight of such technology.

The objective of this article is to give an overview of information flows, networking, and collaboration within organisational networks providing safety telephone services to ageing people. The analysis is done on the basis of qualitative interview data. As a corollary, this article produces recommendations for practical development work. The article is based on a comprehensive qualitative investigation of operations of several safety telephone service networks. It touches briefly upon issues such as (i) customers' – ageing people's – opinions and requirements concerning safety telephone services and appliances, (ii) operations and work arrangements at call centres, (iii) service chains of customers, and (iv) competence requirements of personnel working in these services.

The amount of alarm and technical information received and transferred in call centres is treated here as background information only. The challenges in this field may largely be solved with improvements in the technical arrangements of the call centres. As the topic is network collaboration, the whole of safety telephone services cannot be discussed. Different types of safety telephone appliances and optional calling systems and their usability, for instance, are thus not described. The history and legislation of safety telephone services are also beyond the scope of this article[3].

TERMS AND DEFINITIONS

The concept of *customer* refers to end customers – ageing persons utilising safety telephones. For *ageing persons* no age limit is assumed. Although the use of these telephones is commonly associated with higher age, they may also be used by, for instance, younger disabled persons. A common aspect of elderly persons is their age, but otherwise they are a heterogeneous population with differing requirements and subgroups[4]. A *safety telephone* is a personal apparatus for giving an alarm by pushing a big button. It has a pendant or chain around the neck, or a wristband with also a help button. It has also been called a safety alarm system[5] or social alarm system[6]. Well-being wristbands and mobile safety telephones as well as various types of accessories exist today such as dosers of medication, fire alarms, door alarms, and epilepsy alarms. According to a recent definition[3], safety telephone service consists of a safety-telephone customer, a call centre, and safety helpers who call on the customers to provide help or check up after an alarm has been given. From a slightly different perspective[7], safety telephone services contain alarm appliances, reception of alarm information, alarm and check-up visits, and check-up calls. These definitions, however, need to be complemented by including telephone installers and medical institutions such as health centres and hospitals as essential parts of safety telephone service systems.

Network management: Virtual organization and virtual teams

A network is here defined as "a fluid, flexible, and dense pattern of working relationships that cut across various intra- and interorganisational boundaries"[8]. The concepts of network and networking refer here to heterogeneous, multi-actor, multi-sectoral, multi-professional networks based on virtualisation – not the more usual corporate arrangements.

It has been emphasised that networks have an identity separate from their individual members, and network management needs to empower the network through separation of the operative network management from members' individual

processes[9,10]. An organisational socialisation process is necessary to balance the opposite pressures of autonomy and consensus. Institutionalisation of the network requires conscious efforts in shared value creation and active relationship management towards mutual goals[10]. These views are important here.

Virtualisation implies "the vanishing of the formal and spatial boundaries of firms"[11]. It is here understood from a somewhat wider perspective covering not only firms but also other service providing organisations from the public sector, non-governmental organisations, foundations, and co-operatives. More generally, virtuality means "without a place as its home. Virtuality requires trust to make it work.[12]" Virtual teams have been defined as "composed of co-workers geographically and organisationally linked through telecommunications and information technologies attempting to achieve an organisational task"[13]. A virtual organisation[14] is an organisation to which different people contribute, from the strategic apex to the operational level, but not necessarily in a coincident way with regard to time or space. In the present article, the concept of virtual network is used as representative of the variety of actors and organisations.

Trust is both an institutional phenomenon and an interpersonal phenomenon. Creating trust is part of relationship building. It has been claimed that both building and repairing trust in social relationships can only be achieved in face-to-face contacts[15]. Such contacts are difficult to arrange in virtual teams. Practical suggestions for leaders and team members of virtual teams and/or organisations may be found in[16-22]. For a more detailed discussion, see[1].

METHODS

The data for this analysis included: *(i)* written material ranging from memoranda to minutes of meetings to formal reports; *(ii)* organisation charts, personal records, maps, graphs, service statistics, etc.; *(iii)* open-ended and semi-structured interviews (the main data collection method), use of informants, and intra- and inter-organisational workshops; *(iv)* absorbing and noting details and actions in the field environment.

Structured interviews and written questionnaires were seen as inappropriate for an analysis of this kind. The semi-structured interviews assumed a conversational manner, but the interviewer followed a pre-prepared set of questions that concerned the networks' characteristics and work practices as well as information flows and management. The interviews were audio-taped and transcribed for analysis. After the analysis, the results were sent to the interviewees for feedback and comments. The results were also discussed at several intra- and interorganisational workshops, seminars, or meetings.

The networks represented different types of safety telephone service networks in Finland, and one in Sweden for comparison. The branch is very fragmented. Municipalities have systems of their own or they purchase the service from a private service provider. Within one municipality, there may even be several systems simultaneously. For instance, there may be internal systems in blocks of service flats, a municipal system, and several private systems in operation.

The forty interviewees represented different types of safety telephone service systems of different sizes and operating in diverse locations. Most of them represented a nation-wide network offering safety telephone services all over Finland. Seven were from municipal systems (two Finnish,– one Swedish), four

from blocks of service flats (one system operated by a foundation and another by a co-operative), three represented a system operated by a non-governmental organisation, and four were from a pilot project testing mobile safety telephones.

The Finnish-nation-wide network was by far the most interesting and challenging with regard to information-related issues and network collaboration and received most attention. Inclusion of the other types of networks for comparison increases the validity and reliability of the results. The bias in favour of the nation-wide system does have an impact on some of the emphases, but challenges and development needs were largely the same, apart from the very small networks in blocks of service flats. Differences lie in the scale of the various challenges.

The study was undertaken in the period from August 2001 to May 2003. The municipal social and health care sector was represented by 12 interviewees, companies also by 12 interviewees and non-governmental organisations, foundations, and co-operatives by 16 interviewees. The types of organisations and professional groups were representative of the branch. Half of the interviewees were managers, such as managing director, director of block of service flats, director of municipal services for the elderly, and home care supervisor. The other half were employees such as social worker, home helper, clerk, and planner. There were 29 women and 11 men among the interviewees.

Primary populations served by the agencies cannot be disclosed due to confidentiality agreements. As background information, 40 interviews undertaken by another researcher among customers of safety telephone services were used[23] as well as results of a survey undertaken at a large call centre[24].

RESULTS

Types of information within safety telephone services

Discussions on information processes centre around alarm information as the foundation for the service type. However, even safety telephone service professionals appear to concentrate overwhelmingly on alarm information, without giving the necessary attention to the other types of information, which are seen as self-evident and are wrongly omitted from planning.

Information transferred within the networks can be divided into four types: customer information, information related to alarm calls, technical information, and information related to the collaboration network. It needs to be emphasised that these were identified as the distinct types of information that are transferred in the networks. For instance, information to the customer and to near relatives at the time of installation is essential, but it is not transferred in the networks.

Table 1 reports examples from the interviews. Requirements for the precise contents of the different types of information vary somewhat across the different types of networks – depending on their environment and operations. For instance, in an internal system of a block of service flats, the personnel knows the customers and deals with alarm calls, so there is hardly any need to transfer customer and network information.

For one of the networks, detailed survey data are available on the reasons for incoming alarm calls. The figures can be considered fairly representative for safety telephone services in general. Of altogether 759 alarm calls that came into a company-owned call centre during three days in the autumn of 2002, as many as 80 per cent were related to technical faults, needs to change batteries, test alarms, needs to have social contact, alarms without a cause, and false alarms. These

Type of information	Examples					
Customer information	Customer's contact information	Condition of customer's health	Customer's medication, technology aids, such as hearing aid, other related services, typically municipal home care	Near relatives and their contact information	Changes in information mentioned	Expressions of consent regarding information transfer
Alarm information	Customer's name and address	Reason for alarm call	Basic information on customer's health	Special remarks, e.g. exceptionally poor hearing	Information on near relatives if they should be informed in case customer is hospitalized	Information on visits and actions by safety helpers
Technical information	Broken appliance	Need to change battery of appliance	Disconnection and connection of appliance	Service needs related to, e.g. thunderstorms		
Network information	Organization of operations	Changes in organization of operations	Contact information of collaborators and changes in it	Feedback from customer	Feedback from collaborators	

Table 1. Types of information transferred within safety telephone services

usually do not lead to sending help to the customer. In only 0.4 per cent of the cases, the person in charge at the call centre got in contact with the regional (governmental) emergency centre and called for urgent ambulance transportation. Other kinds of helper were called for in 14.3 per cent of the cases, such as non-urgent ambulance transportation, visiting nurse, home helper, personnel at a block of service flats, night patrol, or near relative[24].

Information flows

Figure 2 illustrates flows of customer information and information on alarm calls of a large safety telephone service network within one city. The net of information flows is quite complicated even in only one locality. The service structure was found to be somewhat different in every locality. The call centre may have fewer collaboration partners than in Figure 2, for instance in small towns or in the countryside, but each arrow between two actors is a potential bottleneck. Figure 3 gives an example of alternative service chains of a customer in one locality, as an alarm call comes in.

Bottlenecks in flows of information were found particularly on changes in customer information to all the relevant partners in the local networks and on changes in customers' health condition. Bottlenecks in alarm information flows were found between the call centre and safety helpers and in information to other professionals on safetyhelpers' visits. Flows of technical information were found to be relatively straightforward, without bottlenecks but challenging with regard to timing. Flows of network information are sporadic, if that kind of information is transferred at all, which results in numerous bottlenecks.

The following bottlenecks were found in all four types of information flows: lack of a well-defined methodology for information processes, differences in local service structures, differences in service provision depending on time of the day, collaboration between the public, private, and third sector service providers, and information quality[1]. There are as many parallel systems as there are localities, and this makes it challenging to develop the operations towards greater systematisation and coherence, particularly within the nation-wide network.

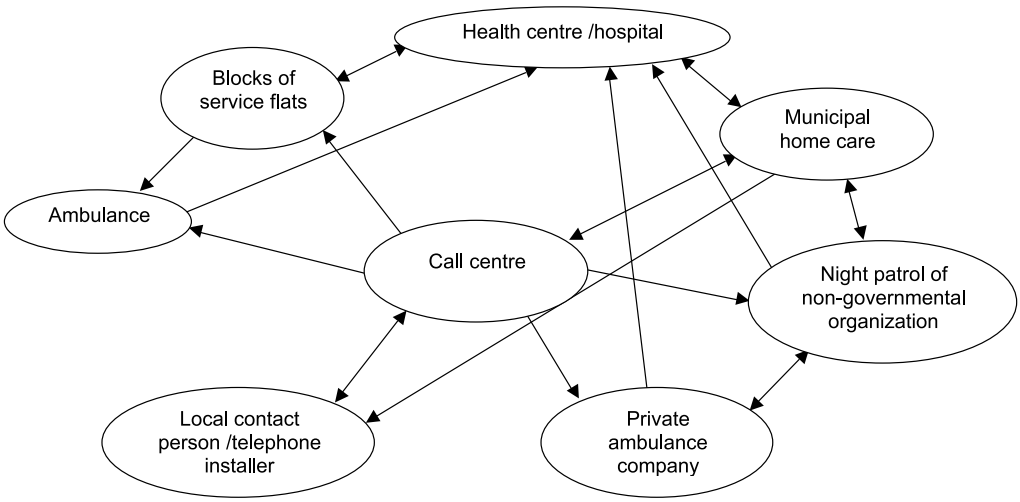

Figure 2. Transfer of customer information and alarm information in one city within the safety telephone service network

Network collaboration

Central themes

Network collaboration is a prerequisite for many of the possible improvements in information flows, and vice versa. Through mind-mapping techniques, the following themes were discerned as central in the relationship between information flows and network collaboration: (*i)* Personnel in safety telephone service networks; (*ii)* Virtual networks and trust; (*iii)* Collaboration between public, private, and third sectors; (*iv)* Initiation into network operations and communication; (*v)* Installation of safety telephone and guidance on its uses; (*vi)* Monitoring of customer's condition; (*vii)* Customers' regional equality; (*viii)* Strategies of elderly care.

Personnel in safety telephone service networks

Personnel issues are here discussed in relation to information flows. The topic was often mentioned in the interviews. These showed that not all safety telephone service customers may get help from a trained safety helper, but the helper may be a taxi driver or even a security guard. Apart from inadequate help, the inclusion of such a wide variety of occupational groups was found to affect information flows. It is even more challenging to ensure provision of proper information flows in such circumstances, for reasons of privacy protection. In addition, participation of taxi drivers and alike in the present systems underscores the responsibility of other, trained actors in safety telephone services for follow-up of customers' health and general condition.

The helper's personality is of utmost importance. Taxi drivers in small towns and in the countryside may be very dedicated to their task in safety telephone services, also because they often know the customers. Without taxi drivers, organisation of today's safety telephone services in Finland would be problematic indeed, as in many environments care professionals are not available 24 hours a day.

Requirements for qualifications of service personnel should be discussed in relation to local circumstances as well as needs and views of customers. Support for independent life at home seems to lead to

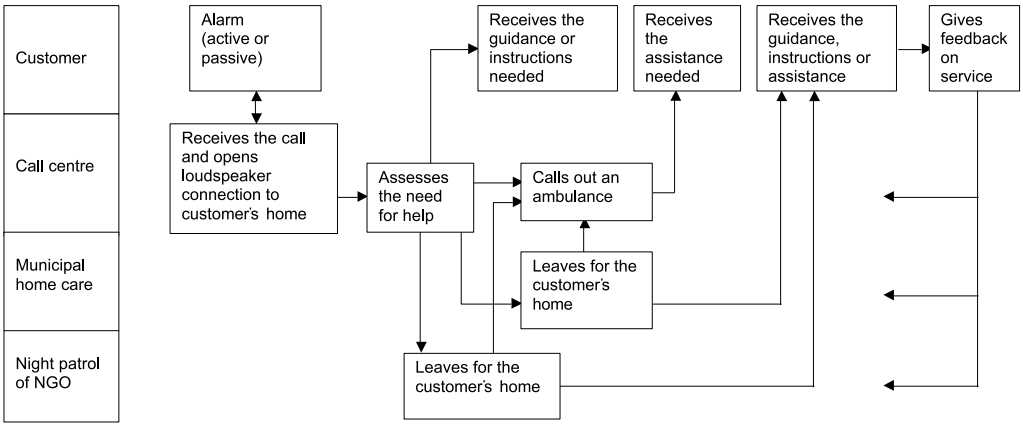

Figure 3. An example of alternative service chains of a safety telephone service customer in one locality

a situation where the reasons for alarm calls may be more and more demanding for the personnel – both those at the call centre and those in the field.

The personnel have to be well aware of their role. During their visit due to an alarm, the helpers have to be able to assess the need for help – whether it is really a question of a 'pure' safety telephone alarm or would the customer need, for instance, home care services in the future. This professional point of view is very important with regard to follow-up of customers' health condition and integration of safety telephone services into the whole entity of a customer's services.

Virtual networks and trust

The large variety of occupational groups results in additional challenges of network management, which, again, is related to shortcomings in information flows. That is particularly clear in large virtual networks based on relatively loose collaboration arrangements. At one end of the spectrum, there is the nation-wide network, in which many factors limit the possibilities for regular face-to-face meetings: place, organisational and sectoral boundaries as well as even time, due to different working hours. At the other end, there are the in-house 'networks' of blocks of service flats, in which hardly any limiting factors exist.

Regular face-to-face meetings have been regarded in earlier studies as essential for building trust in networks. Even if the limiting factors of different places and organisational boundaries can be partly overcome by using communication technologies, it may be troublesome to arrange meetings. In most of the networks investigated, communication technologies are not yet used to a large extent. The combination of hindering factors has led in the bigger networks to a situation, where collaboration partners, particularly individual employees, are distant or completely unknown to each other. Organisations and individual employees do not sense that they belong to a network. This was found to affect information flows related to the collaboration network, its organisation of operations and changes in this organisation. The results also showed clearly that the state of network information contributes to the basis of transfer of customer and alarm information.

Building trust starts from how collaboration is defined, initiated, and structured. Participants in safety telephone service networks interact through partially

independent tasks, but they should be guided by a common purpose – especially as the networks are formed for continuous service provision. It seems that both the rational: fluency in communication between team members, and social perspective to trust: a moral obligation between team members to do what is agreed upon, should be focused on in order to ease information flows. In virtual networks, ambiguity among collaboration partners easily arises also because of unclear responsibilities and duties related to network management.

Collaboration between public, private, and third sectors

Collaboration between the public and private sectors is still taking shape within the social and health care sector in Finland – including safety telephone services. The interviews showed clearly the unclearness in methods of implementation of collaboration. Differences in organisational cultures between companies and municipal home care are hampering collaboration. Challenges related to financing of the public social and health care sector in the ageing society affect the work of professionals. Their time and energy hardly suffice for development efforts, although they are aware of problems and are interested in solving them. The third sector: non-governmental organisations, co-operatives, and foundations, contributes to the variety of actors.

Unclearness in methods of collaboration also affects negotiations on contracts of purchase of services. Content and comprehensiveness of contract provisions were found to affect information flows to a large extent. Some municipal authorities acknowledged this in the interviews, while others recognised the difficulty of negotiations, but did not seem to be well aware of the connection between contracts and information flows.

Thinking of safety telephone services as a clear unity does not necessarily correspond to practice. The same interviewees, who saw a clear service unity when contracts were discussed, emphasised the complexity of the services earlier or later during the interview. Attention is perhaps not given to integrating the 'system knowledge' of municipal personnel into contract negotiations.

The interviews reflected the complicated sub-contracting arrangements within safety telephone services. Some very small company may provide services, for instance, in the form of night-time help. Under municipal home care, there may be different pilot projects that are managed by non-governmental organisations and aimed at special groups such as those suffering from dementia. The perspective of quality control is challenging in the multi-actor safety telephone service networks – whether it is a question of services offered to the customer by the municipality or services subscribed privately by the customer. Some of the municipal interviewees were quite content with the collaboration with private companies.

The interviews showed the variety in how reporting, continuous communication, and orientation – factors of crucial importance for information flows – are included in contracts of purchase between municipalities and companies. A few municipalities had included a duty to report on safety helpers' visits: the number of visits, the customers concerned, times, and reasons. Others had not included such a provision, but representatives of those municipalities often expressed the need for up-to-date information on these matters. For some municipalities, despite the lack of relevant provisions, the service provider reports regularly on safety helpers' visits.

It was found that provisions on orientation and continuous communication are

missing from contracts of purchase. Practices are quite varied. Invitations of tenders drawn up by municipalities are not focused on such matters. The needs of municipalities are not necessarily reflected in invitations of tenders. Companies and other service providers will include in their tender a minimum of such provisions only, unless more is requested.

Initiation into network operations and communication

Although initiation into network operations and ways of work is indispensable at the beginning of collaboration, initiation was not focused on for ensuring that all collaboration partners till the end of the alarm chain 'get the picture' and can position themselves as part of the whole. It may be too technically oriented towards safety telephone appliances and their use. The initiation is also one-sided (for instance, from a call centre company to municipal authorities) instead of the necessary mutual approach.

There was one exception among the networks investigated – a big municipal network, where special attention is paid to integrating the private service providers into the network. They are oriented into the work of the network, and the requirements of the call centre are clarified to them. Also, their views and requirements are listened to. According to the other interviews, all too often ease of collaboration depends primarily on an individual person or individual persons. At the beginning of operations, as lines of action are taking shape, this probably cannot be avoided completely.

> *"It is an advantage of a smaller town that customers are known and in the sphere of many kinds of services, and collaboration partners are known, [...]" (Employee of private care service company, nation-wide network.)*

However, in many of the localities and networks, it seemed that little attention had been given to ensuring continuity of smooth collaboration and sustainable development of the services. In particular, during and after major changes in the operations of the nation-wide network, communication and new initiation had been lacking.

People involved in safety telephone service networks learn a lot if opportunities are provided. There are spontaneous links in the nation-wide network, and experiences are exchanged through 'study visits'. There can be major differences between localities within one big network; what is quite advanced in one locality, may still be in its infancy in another – and vice versa. It was found that those engaged in this spontaneous mutual learning valued it greatly and intended to keep it up. However, they experienced it as a complementary activity and were hoping for increased systematic communication. Many of those who had not had the possibility to engage in such learning expressed their willingness to participate.

It appears then that initiation and continuous communication facilitate overcoming of bottlenecks in information flows, such as relaying of information on hospitalisation of a customer and on visits of safety helpers. On the other hand, the investigation showed the difficulty of co-ordinating the variety of actors in safety telephone services in big cities. These services are in uncounted ways intert-wined with municipal social and health care services, and the number of persons who ought to be initiated and kept informed becomes overwhelming. However, the results indicated that in small and medium-sized towns and in the countryside, progress could be made through awareness raising and definition of systematic procedures, rights, and responsibilities.

Installation of safety telephone and guidance on its uses

Initiation and continuous provision of information also concern customers. Local conditions affect installation of safety telephones. There are quite varied practices related to who installs the telephone to the customer's home and how guidance is given on the use of the telephone: how and when to use it, and how to notify changes.

Moment of installation

The moment of installation is of crucial importance for the 'success' of safety telephone services not only from the customer's point of view, but also from those of the service system and the network – and its information flows. It was found out that in most of the networks investigated, no clear procedures are defined for how guidance should be given to the customer during installation. Within one network, different installers have quite different approaches – one aimed at emphasising simplicity and reducing possible anxiety about the use of the telephone by giving little information in a very focused way. Another installer emphasised strongly that installers should encounter the anxiety that customers often have; they are nervous about the appliance and the wristband. Anxiety can also be related to fears of control and loss of privacy.

> *"There is quite a lot of suspicion – is the alarm audible and from how far. […] When there are detached houses with gardens and rear buildings […] Questions are also asked of security chains; 'what do I do now as I have a security chain on the door and I am used to keeping it closed, how does the ambulance driver get in?' – and 'how do the alarms function, if I push, and if I cannot hear anything?' And, 'what if I make a false alarm?' So, we take time at the installation for explaining these things. And we may have to explain several times that 'it doesn't matter at all, if the call goes to the call centre." (Local contact person/ telephone installer, nation-wide network.)*

It was found that not all installers within one network give written instructions, and when they do, the instructions do not give details of which changes should be notified such as changes in health condition, medication, or contact information of near relatives. Moreover, the interviewees strongly emphasised the need for continuous initiation and communication towards the customers.

Guidance on uses

Service providers were found to have different principles concerning acute emergencies. Can the customer use the safety telephone in case of emergency, or should she/he then call the general emergency number 112? Different instructions are given to customers and near relatives in different localities. The principles of the call centre are also often unclear to the network partners – and they are the ones who give the instructions to customers.

The governmental regional emergency centre is often included in the collaboration network, for instance, for answering alarm calls outside of office hours. This may underscore unclearness in people's minds. For customers and network partners alike, it is essential to know unambiguously where to call and when. It is in the interest of all parties concerned that customers' feeling of safety and security is based on realism. Where coherent instructions and guidance on uses of safety telephones are missing, it easily results in the creation of separate, experience-based practices that vary between individual persons.

> *"If, for instance, a home helper uses the safety telephone to call [from the customer's home on her/his behalf], it*

has proved to be a better alternative to call 112 directly instead of giving the safety telephone alarm." (Employee of municipal home care services, nation-wide network.)

In some localities, instructions given to customers may lead to the impression that a safety telephone alarm is a recommendable alternative to contacting the police in case of, for instance, burglary. This is not in line with the principles of the call centre in question, but if it were, then it appears that the same instructions should be given to all in the same network. So, clarity of instructions and guidance should be improved by locality and by network, especially in large networks.

Monitoring of customer's condition

There are often problems in taking into account prerequisites for the use of safety telephone by a customer-to-be. Without a view of the whole, a telephone is easily given to a person to whom it does not suit originally or as a result of a change in health condition. Awareness has to be raised of the responsibility to try to avoid these situations among entire collaboration networks as well as among near relatives of customers. The issue is closely related to the need for timely and complete customer information.

For private companies, the responsibility is particularly demanding, as they also strive at getting new customers. Monitoring of customers' situation after the installation of the safety telephone can take place at the local level in, for instance, the following way:

"Then the co-operation that we have with the municipality – if, for instance, one customer has been visited by the safety helpers several times during one day – then we start to forward the matter. Is this customer such that she/he can still continue living at home?" (Employee of private home care service company, nation-wide network.)

Monitoring in multi-actor networks requires trust among the partners. The interviews reflected quite varying degrees of trust in different localities.

"… One inhabitant in a block of service flats is such that during the day, the staff takes the wristband away, so that the customer cannot give an alarm, because she/he gives it every five minutes […] In my opinion, it tells a lot about how a person is doing, if there is a need for continuous alarms at night. […] So, we are experts during our working hours, and those working during the day are experts in daytime matters. […] Our assessments are, after all, trusted and appreciated." (Employee of private home care service company, nation-wide network.)

Customers' regional equality

The wide variety of local structures has resulted in lack of regional equality among customers. Differences were found in, inter alia, how much time elapses from the alarm call till the safety helpers show up, what kind of a helper comes to the customer's home, costs of services, and possibilities to obtain the service in the first place. Differences between rural and urban inhabitants as well as between private and municipal customers are examples. In small towns and in the countryside, customers are well known, and the help is likely to reach them faster than in big cities, although the distances would be long in kilometres. The helper who arrives is, however, often not a care professional.

There are differences between municipal customers as well. In some municipalities, there is a limit to income for persons wishing to obtain a safety telephone as part of public service provision. In other municipalities, criteria are based on health condition. The municipalities also have highly varied preconditions in terms of the

number of safety telephone customers they can have – depending also on whether they purchase the services or produce them independently. The type of customers – private or public – often affects transfer of information between service providers as well as the extent to which safety telephone services are integrated into the whole entity of a customer's services.

Regional inequality is caused also by technical possibilities to install a safety telephone to customers' homes. In some border districts of Finland, wired telephone connections have been changed to wireless connections, which do not enable use of traditional safety telephones. It appears that improvement of regional equality among customers requires increasing attention – as the need for safety telephone services is expected to increase. Mobile safety telephones are already in use, and in the future, customers will increasingly be able to give an alarm from outside their homes. The use of mobile phones already affects the use of traditional safety telephones. However, normal mobile phones cannot entirely substitute traditional safety telephones.

Attitudes towards and practices concerning 'chaining' of the alarm calls so that they first go to a near relative, chosen by the customer at the time of subscription, and only if she/he does not answer, the call is relayed to the call centre – were found to be quite varied. This is also related to regional equality. Within one big network, chaining may be possible for customers in some localities – and not in other localities. There was no consistent policy and the reasons were not clear even to the network's telephone installers.

Two points of view concerning chaining were *(i)* functioning of chaining needs to be ensured very carefully – along with chaining, answering the alarm call may be delayed, and technical factors may cause the service to become less reliable if, for instance, the alarm is first relayed to the near relative's mobile phone, and *(ii)* the personal safety net of the customer is supported and maintained. An intermediate form is that the alarm call is first relayed to the call centre, but from there to a near relative – before an external service provider. The investigation implied that an unambiguous and universally applicable solution obviously does not exist, but customers, near relatives, and service providers within networks should know the different alternatives and their characteristics.

Strategies of elderly care

In the whole of elderly care, safety telephone services are regarded perhaps too literally as support services. In municipal practice the importance of these services as an enabler of independent life at home is not always properly acknowledged. The wide-ranging co-operation and complex service structure that these services typically require also appear to be overlooked. Safety telephone services are hardly taken into account in today's municipal level strategies for elderly care. The strategies emphasise, for instance, matters related to construction, or alternatives such as institutional living and their costs. Safety telephones may be mentioned, but the effectiveness and development of the related service system are not considered. By including such services in municipal and national level strategies, improvements in co-operation arrangements of the service networks, information transfer, and quality as well as regional equality could be facilitated.

Those working in safety telephone services in small and medium-sized municipalities hope for broad co-operation at municipal, or even regional level. As there are often

several parallel safety telephone service systems particularly in big municipalities, nobody has a picture of the whole.

There appears to be a great need among potential customers and among municipalities to find out about different safety telephone systems. Handling matters related to safety telephone services in mutual meetings and strategies might improve individual customers' possibilities to obtain relevant information. Good channels of communication are pensioners' organisations, congregations, and various activity centres for elderly people. Communication should address the concerns that safety telephones typically cause in anticipation in ageing people's minds.

Roles of network actors in relation to information

The interview data from the nation-wide network were investigated also to obtain a general view of roles of *(i)* information producers, *(ii)* information custodians, and *(iii)* information consumers[25] within the network. Indicative mapping was done to gain additional understanding about the functioning of the network and to give directions for future research.

The following questions supported the mapping: which activities are undertaken by the different roles, which services do the roles need from their environment, which activities or steps do the actions of the role consist of, and what kinds of messages and communications do the roles undertake with each other. Numbers or percentages are not presented, because the data do not support such definite categorisations. Roles in relation to the four different types of information (customer, alarm, technical, and network information) were not investigated systematically.

In most cases, the interviewees did not seem to be aware of the importance of acting as information producers in addition to other tasks. For instance, a home helper may feel that she/he requires more and better information on the customer from the call centre when an alarm call has come in. However, she/he rarely forwards information on the customer's deteriorated health condition, such as breaking out of dementia, to relevant actors within safety telephone services – even if this change would have a serious impact on the customer's ability to use the safety telephone. The reasons for this lack of awareness seem to be undefined rights and responsibilities with regard to information as well as unclearness about one's role in the whole of safety telephone services. The results showed clearly that every safety telephone service employee would need to be aware of the essentials of the whole infrastructure behind the services.

CONCLUSIONS AND RECOMMENDATIONS

Safety telephone services and their virtual networks were felt to be a particularly challenging research environment, as there were many completely different types of information transferred in multi-actor, multi-professional, multi-organizational, even multi-locality networks. Moreover, information flows form the basis for the operations in an especially clear way. The importance of information-related matters and networking is claimed to be beyond comparison with many other fields. Moreover, different kinds of distance care and distance service arrangements are being developed – for ageing people as well as others – and the insights obtained here may be useful for such new types of social and health care services as, for instance, tele-medicine.

Reorganisation of thoughts

There seems to be a need for a reorganisation of thoughts within safety telephone

services. The branch has undergone many changes recently in Finland – and new changes are caused by mobile safety phones and other new technologies that place additional challenges on information flows and networking. The present service systems cope with traditional safety telephones in a relatively satisfactory manner, but without tackling the problems in networking seriously, new product and service development may encounter major difficulties.

The aim of safety telephone services should be reconsidered. Is it restricted to pure safety telephone services, or are service providers perhaps considering more interactive, wide-ranging provision of safety to individuals? For instance, call centres would not only receive calls from customers but would also actively get into contact with them. Possibilities for interactive services or other types of enlargements of the core services depend on networks; these are probably more difficult to realise in big networks than in small, local networks. However, the present article has shown that even big networks consist, in fact, of small, local networks. The first option implies concentration on the present core competence, and the second would attempt to view a customer – a person – as a whole. The latter view then contrasts with the usual planning of technology-related matters from the point of view of caregivers' needs. It would bring ideas from customer relationship management (CRM) into such services[26]. When planning development efforts related to information flows and networking, future visions should be taken into account. Whatever route is taken, information flows continue to form the basis of operations. This was confirmed also in interviews of customers of both traditional and non-traditional safety telephone services in Finland[23].

Service providers should consider that future customers expect to be able to choose more personalised services. Today's aged safety telephone service customers are generally content with very little from the service providers' point of view. They are not active in giving feedback to the personnel even if they feel a need to do so[23]. One may speculate that also the threshold of changing service providers is high for these customers – despite possible discontent. Service providers have a particular responsibility here, and are short-sighted if they let themselves be misled by the present situation.

Increased consciousness

All the corrective actions naturally need to be suited to the service environment and network in question. The following recommendations concerning network collaboration – which are not in an order of priority – are best suited to large networks in particular, networks where customers are not known.

(i). Emphasis should be given to creating and maintaining trust in safety telephone service networks. All the network partners should know that they belong to a network. They should know the characteristics of the network and rights and responsibilities related to network participation. In each individual organisation, responsibilities should be clearly defined as to what and when to act in the context of safety telephone services. This concerns particularly purchased municipal services. Periodical meetings and visits should be arranged, wherever possible.

(ii). Each organisation and employee should be better aware of the impact they have on others and of the connection between other tasks and tasks related to safety telephone services[18]. Every employee and organisation should also pay increasing attention to

quality and predictability matters in communication[16]. Development of a company's innovative capacity and resources is impossible without perceiving the organisation as an integrated entity – a system in which every party acts meaningfully together with others[27]. The same approach needs to be taken in the context of networks.

(iii). Procedures should be clarified for orientation into the methods of work of the network at the beginning of the collaboration. Requirements of all the participants should be clarified and mutual orientation arranged – not only one-sided. After the beginning of the collaboration, as major changes in operations arise, re-orientation should be arranged. The concept of continuous orientation[28] should be adopted in safety telephone services for all parties concerned, including customers and near relatives.

(iv). Design of service profiles by size and service structure of municipality might assist call centre companies in managing service provision according to the needs of municipalities and of customers. Choosing from 'service packages' including also provisions for reporting, orientation, and communication, as well as procedures with regard to information management could be helpful for municipalities that do not always know what to ask for. The 'service package design' approach would also make comparison of different service types and structures easier. The present difficulties in finding out about differences and making comparisons should be relieved – whether it is an individual customer or a municipality, for instance, trying to make a choice between alternative systems, accessories, and alike.

(v). Systematic analysis of feedback and attention to practices related to reception of feedback are crucial in order to gather information on customers' and collaborators' views – and for quality improvement. For instance, if a customer has given feedback on a long waiting time from the moment of alarm until getting help, the whole service chain should be assessed in detail. All the actions taken should be clarified – by, for instance, the safety helper – to the customer or near relatives as soon as possible. It should also be ensured with the help of network management that all the feedback is brought to the attention of the relevant actors in the network. Analysis of feedback and assessment of customers' service chains, again, can be facilitated by means of building registers for feedback and for monitoring of actions taken by service providers. Registers also enable comparisons over time.

(vi). Building of a network information database on the Internet, for instance, could be considered. The database would include a list of collaboration partners, their contact information, notes on changes in these, notes on feedback – possibly general news on the branch as well as on new appliances and accessories, and so forth. Even a stripped-down version with access for all the network partners for updating could bring added value without causing a lot of extra work. A database with more information would perhaps bind too many resources to be cost-effective in these types of services. Appointment of a 'network coach' could also be considered[22].

(vii). Special attention should be directed at invitations of tenders drawn up by municipalities for purchasing safety telephone services as well as at negotiations between municipalities and companies. Provisions for continuous orientation, sufficient training for all the parties concerned, and reporting may otherwise be overlooked. Inclusion of safety telephone services into municipal and national level strategies for elderly

care is also likely to result in improved network consciousness. For suggestions for improvements in information quality within safety telephone services, see[1]. Avenues for future research could include research on development needs and requirements at the national level (for instance, drafting of national level recommendations for these services) and at regional, municipal, and functional unit levels. Leaving the network perspective aside might thus add to the understanding of the branch. At the more practical level, information customer needs profiles could be drawn up for all distinguishable network partners.

Safety telephones can play an important role in enabling effective communication in cases where an ageing person needs help, but the design of services needs to be based on realistic models. Development efforts have to be based on an increasing understanding of what needs to be accomplished in order to fulfill ageing people's needs for safety and security.

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