Saxaren – Strengthening Informal Collaboration among Geographically Distributed Teachers
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ABSTRACT
For people working in situations with few colleagues around, information technology could be used for increased communication with colleagues at other places. One such group is teachers in rural areas. In our work with teachers in an archipelago school distributed over six islands we have focused on encouraging communication using a digital notice board, providing for handwritten, quickly written notes, connecting all islands. Based on the teachers’ collaborative situation, and on the design, implementation and use of the prototype, we illustrate, by a number of recorded notes, how the teachers have been using the prototype, relating the findings to group building, easy access, and playful behaviour.

Author Keywords
Communities, digital notice board, teachers, cooperative design, collaboration, communication.

ACM Classification Keywords
K.4.3 [Organizational Impacts]: computer-supported collaborative work

INTRODUCTION
Close to Stockholm there is a rural archipelago with thousands of islands. We have worked with a geographically distributed school consisting of five units, each on a separate island. The principal, in charge of the whole school, is located on yet another island, connected with the mainland, half an hour drive from Stockholm. There are both known and unpredictable problems that hinder collaboration between the teachers working in the school, e.g., geographical distance and need for boat transportation.

In our work, we have been interested in studying how teachers, with few colleagues around to collaborate with in face-to-face situations, can be supported, through computer technology, in their collaboration with each other. This is part of a wider research agenda focused on “strengthening community” where we attempt, with cooperative design methods, to enable teachers who cannot meet often to feel closer to each other by having more opportunities for informal communication and collaboration.

We have focused on how to strengthen the group of teachers as a community. Much community research is focused on groups that traverse an organization, re-uniting people from a number of formal branches to strengthen various competencies across the organization (cf. Wenger et al., 2002). Complementary to that, we believe that many canonical structures (Brown et al, 2000), especially geographically dispersed, need informal, non-canonical reinforcement for their members to come closer and feel that they have peers to relate to and learn from. In our work with the archipelago teachers, we support informality in their communication with each other, instead of formal ones following a general workflow.

A number of examples of shared interactive surfaces used among distributed groups have been described in the literature (e.g., Izadi et al., 2003). In our work, we have focused on a digital notice board (cf. Greenberg et al., 2001) built on light-weight (cf. Fitzpatrick et al., 2002) and playful (cf. Kendall et al., 1997) technology, where the teachers themselves have influenced the development of the prototype. Light-weight tools are typically based on simple technologies avoiding heavy computational algorithms, and they are quick and easy to use. In hectic work situations, such as the teachers face every day, it is convenient, if not necessary, that the tools used are light-weight.

In this paper we describe our work with the archipelago teachers: the collaborative situation, the design, the prototype implementation and use, from the initial studies of the teachers and their collaboration, via workshops with the teachers to the evaluation studies of the implemented prototype, Saxaren. We discuss findings from the studies in contrast to our ideas of the technology, especially focusing on issues such as light-weight technologies, peripheral awareness, and community building.

METHOD
The aim with the project is to enhance collaboration between teachers in a geographically distributed school consisting of units on five different islands, and to
strengthen the notion of all islands belonging to the same school. We investigated what the teachers’ work looks like, how they act in different situations (e.g., in practical matters regarding the pupils, parents, or even artefacts used), what their goals are, as well as what their needs and desires are. In order to achieve this, our cooperative design process (Bødker et al., 2000) started with the teachers in their own context.

In order to understand the issues and problems facing the teachers, to understand the many aspects of the teachers’ needs, goals, wishes and desires, we used a variety of research and development methods: cooperative design, CSCW, design, programming, engineering and social science.

In our work with collecting data, we arranged two workshops using group discussions about the teachers’ daily work. We visited three of the units, attended meetings between the principal and teachers, distributed a questionnaire about the usage of the municipality intranet, and met with people from the municipality who are responsible for the technical infrastructure. In collection, these sources provide rich information about how the teachers work, what their needs for collaboration and communication are, what the limitations with technologies are, etc.

The design process has been iterative in the sense that all gathered data, from log files, observations, interviews, workshops, etc., and data from previous research in related areas, has continuously been inserted into the design of the prototype. The evaluation has been going on continuously alongside with the development of the design.

THE SETTING

The archipelago school

The archipelago school works as one single school, with units located on five islands in a municipality east of Stockholm. The units are headed by a principal who has his office on Duvö, an island with bridge connection to the mainland. The units are highly independent and seldom rely on each other in their day-to-day pedagogical work. However, the principal emphasised that they are one school and that collaboration between the islands should increase.

One problem for the teachers is that they are distributed on different islands within an area of approximately 77 km² and up to 30 km apart. The regular boat traffic between the islands is limited, especially during the winter months, and taxi boats are very expensive. Three of the units have the same mainland harbour (Norö, Stenhamn and Rovön: Stornäss), while the other two have their own (Sortö: Beda, and Måsen: Smedskroka), see Figure 1.

There are approximately 120 pupils and 15 teachers in the archipelago school. Stenhamn and Norö are smaller than the others, each with less than ten children and only one teacher. Sortö, Måsen and Rovön have children attending all nine grades in the compulsory school, while the others only have children attending the six lower grades. All units have a kindergarten in the same or a nearby building. Pupils in the higher grades have classes in the school on Duvö. Also, Stenhamn, Rovön and Norö, with somewhat better boat connections between each other, have a regular exchange of teaching activities in order to share teaching resources, and to increase the number of pupils that the children from the smallest units meet.

Archipelago teachers, or any other teachers in sparsely populated areas, have fewer colleagues to interact with if and when opportunities arise. Some of the units never communicate with each other, except during the management meetings. Others communicate using e-mail or phone. The principal communicates with all units through e-mail, fax and phone.

Formal tools for communication

The municipality has an intranet that was introduced during our study. The intranet has one part that focuses on all schools in the municipality. Each school has its own space on the intranet where it can manage internal and external school specific information. The intranet provides forums and chat rooms where people can discuss different topics.

At the time of our second workshop, all teachers at two of the units reported that they regularly visit the intranet to get information mainly sent by the principal. The teachers also told us that they were quite enthusiastic and entered a lot of information in the beginning. However, they soon noticed that nobody or few read what they had entered and they told us, in May, that the introductory information about their unit still concerned the winter activities. Checking for new information on the intranet has to be a specific, separate activity that needs initiative and time. It is not a “push”, and is thereby easily forgotten.

Today the intranet appears to function as a repository for documents from the principal and other mainly administrative documents. Before the advent of the intranet such documents were sent as attachments in e-mail or as faxes.

THE SAXAREN PROTOTYPE

Designing for informal communication

Our first workshop, conducted with all teachers, focused on who they communicate with, about what and how frequently. The teachers also rated how important it was to communicate with different persons. We found, among

![Figure 1 A map of the Islands in the Archipelago](image-url)
Figure 2 Saxaren, a Tablet PC integrated in a whiteboard.

The intransit within the municipality may be a suitable support for the teachers to use when communicating with the principal, pupils, and parents. Due to the complexity and the lack of feedback, it will most likely not be suitable for supporting inspiring communication between teachers. The complexity of the intransit is manifest in various ways, e.g., a lack of overview when navigating the system and a slow response time when carrying out simple tasks (such as login, uploading files, and following links).

Also, the intransit is available through computers which, in this context, are bulky and techy, with screens facing the chair in front of the desk, shut down when not worked on, quite slow when turned on, as well as noisy. Therefore, to go to the intransit is an activity that has to be planned. It is not something you just happen to do passing by.

We concluded that an informal communication tool, not structured around organizational lines and rules as the intransit is, could increase the informal communication among the archipelago teachers. This can make the teachers feel closer to each other and make them feel that they have peers around that they can relate to and learn from. Inspired by the “technology probes” used in the Interliving project (Hutchinson et al., 2003), we decided to use an interactive shared surface based on simple and playful technologies, where the teachers in an informal way can communicate with each other. In our view such a tool could encourage the teachers to enhance social communication and thereby increase their feeling of belonging to one school.

The prototype built consists of an interactive digital notice board running on a Tablet PC. To increase the feeling of a notice board, each Tablet PC was integrated in a 90x60 (cm) sized whiteboard, see Figure 2. Using the notice board metaphorically and for real in the prototype, should make it melt into the surrounding and lower the adoption threshold for the teachers, as well as stress the informality of the communication facilitated.

Functionality
In order to get ideas for the functionality in the prototype, we conducted a second workshop with teachers from two of the larger units. The teachers named the prototype “Saxaren” and said that they would post notes about 1) teaching material or interesting articles, 2) study visits or social meetings, and 3) pedagogical issues.

A number of issues concerning the functionality were also discussed during the workshop. The teachers pointed out, several times, that Saxaren must be easy to use without any demands on replying to messages. They also decided that the principal should be included in using Saxaren. Other small, but still important, functionality issues mentioned by the teachers are related to:

Overview: using different colours on the notes depending on how important the information is, providing a possibility to see which notes that have not been read, to see which unit that has written a note, and letting old notes automatically be removed after a certain time,

Interaction: providing a possibility to erase text in a note before, but not after, it is posted, providing a possibility to reply to notes, either inside the note or as a new note, making it possible to use images or videos in notes, and sending notes through e-mail to Saxaren.

The interface
Most of the issues asked for by the teachers have been included. The only functionality not included so far is to send notes through e-mail. Our focus was to make the interface as simple as possible, as requested by the teachers. Hence, we have tried to keep the interface as “clean” as possible. Let us give an example: A note is created by touching, using the optic pen, either on the yellow or the orange note in the upper left corner, see Figure 3.

Figure 3 The note board. The notes were quite small in the early versions of Saxaren, making it necessary for the teachers to open a note in order to read it.

When a note is opened, see Figure 4, four colours of the pen can be chosen (black is default). When saving the note the user touches outside the note that is presently written on. This also closes the note.

A note that has been saved can be re-opened and text can be added, i.e., there is a possibility to edit notes in order to write a reply. Notes can be removed by anyone, i.e., there is no ownership to the notes. If one regrets what has just been written, before saving the note, there is a possibility to erase that text using the eraser besides the wastebasket.

A note is opened by touching it with the optic pen and closed by touching outside the note. When a note is open it
is possible to see when it was created and which unit that has written it (the small text to the left of the eraser). When touching the “i”-icon even more detailed information is given about who has edited the note and when.

Figure 4 An open note:
“Have a nice summer, best wishes from Rovön”.

Apart from a simple user interface, managing Saxaren also needs to be simple for the teachers. We therefore installed software making it possible for us to manage the computers from our workplace. If a new version needs to be downloaded, we do it. Hence, the teachers can concentrate on using Saxaren.

When opening a new note the teachers can choose if the note should contain a picture. Touching the camera icon gives a preview window that is part of the note. Touching the camera icon again triggers the taking of the picture. If the teacher is unhappy with the picture it is just to point at the camera icon again and get another preview.

INSTALLATION & PRACTICALITIES
In November 2005 the prototype was installed at all units. For the teachers, it is important that Saxaren is available from a central place, i.e., a place where the teachers pass by several times a day. It is of crucial importance that the teachers are able to frequently get a quick glance at Saxaren, to see if anything is new. This appeared to be more difficult than expected. No unit is the other alike, providing different environments to install the prototype. All installations were made by advice from the teachers.

At Stenhamn we had two choices, either the very small office where the teacher spends time during the day, or the teacher’s private apartment upstairs. Together with the teacher we decided that the small office was more regularly visited during the days, and that is where Saxaren was installed in the end. It was quite challenging getting enough space to install Saxaren behind the desk and under the stairs. In the other units we found suitable places, either in a separate room where the teachers meet during breaks, in a kitchen area, and in an entrance hall.

It is important that Saxaren is easily available to the teachers, but not to the pupils. At two of the units this was impossible. Sortö do not have a suitable separate office for the teachers (they have a room where there is usually no teaching, but the teachers are seldom there during the day). Instead, Saxaren was installed in one of the two classrooms, beside the sink and the coffee machine. At Norö there is no suitable space on the walls other than in the large entrance hall. However, on the only available wall there is already a notice board. Therefore, Saxaren was installed on one end of the other board. The other units had better opportunities to install Saxaren in rooms with no access by the pupils, but where the teachers still passes by several times a day.

The problem of finding suitable places to install Saxaren also affects the body posture a teacher has when writing a note. The teacher at Stenhamn has to lean over a small desk in order to reach and be able to write anything on Saxaren. He is left-handed which makes this procedure even more complicated. At Sortö Saxaren is placed quite low, making it difficult to write in a standing position. At Rovön one of the teachers is very short, having difficulties reaching up. At Norö Saxaren is placed quite low, resting on a cupboard, making it difficult to have a good writing body posture. These complications may affect the physical access of Saxaren, i.e., that the teachers hesitate to use Saxaren because of the inconvenient body posture of writing.

Logging data
All activities performed by the teachers when using Saxaren have been logged in a database. All notes are stored including which unit created it and when, how many times it has been read and by which unit, what changes that have been made to the note, by which unit and when.

Removing data from the first introductory month, the numbers of notes created, opened, changed, and deleted by each unit, January until June 2006 (a period of six months), are shown in Table 1.

Table 1 The number of notes created, opened, changed, and deleted by each unit from January to June.

<table>
<thead>
<tr>
<th></th>
<th>Stenhamn</th>
<th>Norö</th>
<th>Duvö</th>
</tr>
</thead>
<tbody>
<tr>
<td>created</td>
<td>23</td>
<td>7</td>
<td>38</td>
</tr>
<tr>
<td>opened</td>
<td>45</td>
<td>225</td>
<td>37</td>
</tr>
<tr>
<td>changed</td>
<td>14</td>
<td>21</td>
<td>6</td>
</tr>
<tr>
<td>deleted</td>
<td>14</td>
<td>21</td>
<td>6</td>
</tr>
</tbody>
</table>

The number of notes created, opened, changed, deleted, and with a picture (possible from mid February) since the date of the installation varied, both during the period and between the units. The activity was higher during the first four weeks, and also increased with a new release. In a regular week, 5–10 notes are created and/or changed. In many cases an island has opened the same notes several times. A major reason for this is that, in the earlier versions of Saxaren, it was difficult to see if a note had been changed or not. It does not, however, coincide with the number of teachers on each island.

MESSAGE CONTENT
Of all notes created from November, 85 are work related. Such notes can be informative, sometimes commented on by others, or posing a question, sometimes answered by someone else. Other notes (74) are related to the prototype
and either playful in their character or clear tests of the functionality provided by the prototype. Some notes (25) are related to social information or include greetings.

The content of the notes is quite diverse. First, group building and strengthening the group of teachers as a community will be discussed. Second, the work to make Saxaren work, i.e., the “unanticipated overhead” that comes along with the introduction of new groupware (Bowers, 1994), will be discussed. Third, overview, i.e. how to, by a quick glance, in the peripherality, see if something new is on Saxaren, will be discussed.

Group building
One of the purposes with Saxaren is to strengthen the group of teachers working in the school as a community, i.e., the feeling of belonging to the same school. In the notes we can see clear evidence of messages contributing to this: notes characterised as informing, greetings, playful, and multi-purpose.

Informing notes contain some kind of information directed to all teachers, or to specific units or persons. One example is: “Evelina! Can I ride with you to the management meeting tomorrow Wednesday 18/1. Timmy”, “She says yes! Regards Mimmi”, “Going with 8.35 from Stornäs E-L”. Timmy is asking for a ride from the harbour Stornäs to the unit on Duvö. Evelina replies, through another teacher, that it is ok. Evelina later clarifies which boat she intends to take from Rovön. Timmy might as well have called or sent an e-mail to Evelina directly, but he chose to put up a note, showing everybody else what is going on. This behaviour is confirmed by the interviews conducted with some of the teachers; they want to show others what is going on, in an informative manner. However, there are also teachers who say that they prefer using e-mail in such situations.

Greeting notes are typically quite short and created before a holiday or weekend, providing for a nice atmosphere within the group, e.g., “We wish you all a nice winter holiday! Look at V-torget John, Berit”. Some of these notes are like post cards, see Figure 3. Only, they are easier to write in Saxaren than as regular post card.

There are other kinds of notes with social information as well, e.g., one containing an invitation to a social event on one of the islands: “Hi all! Traditional light festival on Stenhamn 10th of Dec. Timmy”. The event referred to on the note is related to the local community on that island. This is interesting in the aspect of strengthening the teachers’ as a community, since it is a social invitation going beyond the boarders of work.

In a group of people that is familiar with each other, it is also common that people share resources. A note from a teacher exemplifies this: “Hi! all. Norö kindergarten wonders if there are any tricycle they can borrow from any kindergarten”. Without Saxaren the teacher said she would have used e-mail to ask for the tricycle.

Playful notes contain information that is of a less serious character and that, to some extent, goes beyond formal behaviour that exists in a workplace. One example of a playful note is the one shown in Figure 4. This way of producing information that has no relevance for the actual work to be done, but strengthens the sociality within the community, occurs now and then, and is also accepted and supported by the principal. In the interview he described the usage of Saxaren as something that unites the whole work group because of its informality.

A number of the notes posed on Saxaren have a multi-purpose, i.e., dealing with several topics at the same time, as is typical in ordinary letters. In one note Cajsa has written a text dealing with three different topics: an excuse about her handwriting, a reply on another note, giving a different version of a story, and a problem of how to get the pupils to the dance on Wednesdays. In the interview, Cajsa told us about her difficulty in writing on Saxaren and that she therefore is not very good at using it. In her unit, Saxaren is located quite low on the wall, making it difficult to write on the board in an upright position.

The work to make Saxaren work
A number of notes entered are related to Saxaren and to make it work by using it. Notes that show what the teachers have done in order to make Saxaren work can be characterised as either playful or test. Test notes have been created in order to try out the different functions, e.g., the function of taking a picture, released in February. Sometimes the playfulness in notes has its origin in a test note, created by one person and later annotated by someone else.

From the logging it is obvious that the period of playfulness and testing is more intense in the beginning when Saxaren was installed, and when a new version of Saxaren has been released. For example, a note created by one unit was left empty. It is not clear why it was left empty, but we know that the unit that created it is one with a lower level of intensity in using Saxaren. Less than an hour later another unit added the text “Secret message??” to the note, indicating, in a playful manner, that who ever left the note empty should either enter a text or remove it.

The picture on the note in Figure 5 was taken to test a new version of Saxaren when the principal visited Mäsen. He tried out the new function by taking a picture of himself, also adding a text about where he was located. The note was changed by Sortö two minutes later, adding glasses to the picture and a text about this playfulness. When asked if he (the principal) could think of situations when the camera could come in handy, he was reflecting on the very same note, laughingly saying that: “It looked nice... so it was ok!” But he was not sure what to use the camera for. He had thought about taking photos of information paper sheets instead of faxing them to the units, but found that the resolution was not good enough.

“Cleaning up” appears to be important in order to see what is new on Saxaren. One teacher wrote the following message in late November: “Dear colleagues! If you want to help an old lady not to waste time on enlarging far from new small boxes ... this lady will be happy if you erase old
crap 3 sec ... on the waste basket Hugs! Evelina”. This is a rather playful request to “clean up” outdated notes, as well as an instruction about how to do this. In a later version of Saxaren new notes are emphasised by a thicker frame and notes not written on for two weeks are automatically removed.

“Hi; I am at Mäsen now and will go home tonight in the snowstorm together with Arvid. Exciting, Principal” “You look good. How do you like your glasses? /Anita”

**Figure 5** A playful note with a picture.

While engaging and playing with Saxaren, teachers learned about its features, and challenged each other on how to put the newly learned features to use. As Bowers (1994) would argue “the work to make things work”, i.e., the work needed to get a CSCW system assembled, configured and put to use, is often forgotten by CSCW design and is most often unpleasant. We find here an instance where the work to make Saxaren work is playful and fun. We could better call it “the play to make things work”.

**Peripherality and overview**

The “cleaning up” on Saxaren, as discussed above, is, for several teachers, necessary in order to get an overview of what is new on Saxaren. In general, there are no more than ten notes at the same time on Saxaren. The note about the request for cleaning up is a clear example of this. Teachers in the archipelago school are very occupied during the work-day, making it necessary to, by a glance and in the peripherality, be able to see if anything is new.

The issue of getting an overview to see if something new has happened is an issue that has been discussed when we met with the teachers during the management meetings, and during the interviews. The notes on Saxaren were initially quite small (the size has been increased in a release in May), and it was difficult to see if a note was new or not without opening it (new notes are since April emphasised with a thicker frame). This may explain the large amount of notes that has been opened.

The principal mean that Saxaren “…is so good because every one can see … and I don’t have to go into the computer and look up things and e-mail the stuff…”. On the question if he really knows that every one reads his messages he laughs and says: “No, I don’t know that but I hope. Some write that they have seen and so…”. This comment reflects on both the group building aspect and the overview aspect. The principal uses Saxaren as one communication channel among several. An example of several units writing on the same note is given in Figure 6.

One teacher explains that she watches Saxaren every morning when she comes to work and that they talk about Saxaren in her unit in sentences like: “Have you checked the screen today?”. They keep an eye on it and inform each other about new messages. Hence, the overview of Saxaren gives an overview of work related as well as other activities, which in turn gives everyone a better and joint understanding of the group.

**Figure 6** A work related note about collecting material for a folder.

“**The Folder** Hi A sharp reminder! Give material to Caj S on Mäsen Principal”, “Norö faxed their Monday”, “We have sent material What has happened with this? Sortö”, “I’ll try to fax!!! Timmy”

**EVALUATION REMARKS**

During the time the teachers have used Saxaren we have seen a number of different kinds of notes, from work related to pure social, and from question/answer to information/comment. We have seen behaviours of testing Saxaren and playing around with the technology. We have seen notes of a post card character, providing Christmas greetings or other kinds of greetings. In some cases, notes on Saxaren would not have been sent at all without Saxaren, e.g., greetings. In some cases, notes on Saxaren have replaced other formal communication channels, e.g., e-mail. In some cases, notes on Saxaren is duplicated by sending the same information on, e.g., e-mail.

In all, notes as well as comments during interviews indicate that Saxaren may strengthen the group of teachers as a community. As one of the teachers said in an interview: “we have got used to it, it feels unpretentious, easy to use, … from the beginning it was a little tense, I’m not so much of a technologist, but it’s so easy … easy to use”. The principal says that he uses Saxaren instead of the e-mail function in the intranet because Saxaren is easier to use. He says that he typically writes the same kinds of notes in Saxaren as he previously did using the intranet e-mail.

From the interviews, log files, and observations we can see that some teachers felt a little uncomfortable with Saxaren from the start, yet others started to use it right away, but after the first three months most teachers seems content with it. That’s not to say that it works perfectly. There are still things that have to be changed after further evaluation. Despite the positive reflections some teachers are hesitant in using Saxaren because of bad handwriting, little personal contact with the other units, or because they in some situations prefer to write an e-mail. As a last effort in the project we will consider alternative approaches to support those who have not been very active using Saxaren.

What is important is that most of the teachers themselves feel that their group has come together, that the communication, and even the collaboration, between the
islands has increased. An illustration from this is given from what another teacher said in the interview: “... it’s good that it’s on all the time, good when you are in a hurry, it simplifies a lot ... you don’t have to look for things, everything is there (on the screen, authors remark) ... the communication with the other islands is so much easier ... it has increased too, the communication. We feel a little happy about it, walk around smiling …”. Yet another teacher said: “If you are going to inform about something quickly, it’s working great, for example that folder that was supposed to go out and which I was a bit late with, I could write it there so everyone knows ... we have like a routine that we write so everyone knows, like ‘I have seen’ or ‘ok’ ...”

The teachers’ daily work is tightly scheduled. For them to start the computer, wait for it to “open” takes time (they cannot leave their computer on while giving a lecture). In such cases, Saxaren has been used to inform that there is something worth reading on the intranet.

The fact that Saxaren is always on, easy to use, and placed so that they can see it at a glance helps defining their use of it. They do not use it for heavy documents. That can be done on the intranet. Instead “post-card” greetings, questions, short information or just playful notes that does not take much time to create and can be done instantly and collaboratively are important. It makes the teachers feel closer to each other and strengthens their group.

DISCUSSION

As stated in the introduction, we have been interested in how simple and playful technology can be used to support geographically distributed teachers in their informal communication with each other. Teachers, or any co-workers, in rural areas have few colleagues around to collaborate with in face-to-face situations. Teachers in the archipelago school, with units on five different islands, and the principal on a sixth island, have participated in our design of Saxaren, a digital notice board providing means for informal communication in an attempt to strengthen the group of teachers as a community.

Our multi-disciplinary research group has worked in a cooperative design tradition where the design should start in the teachers work context. We have gathered various data that have been analysed and evaluated continuously in order to be fed into the iterative design process.

We have focused on three major aspects when designing Saxaren. First, we have focused on light-weight technology. Light-weight technology is not a well defined concept, but in Saxaren it is about simplicity, i.e., that Saxaren is simple to use. This is an important issue since teachers in their profession have little time out of classes. The simplicity issue has also been pushed by the teachers as the most important one. Light-weight technology in Saxaren is also about a minimalistic interface, i.e., using icons instead of buttons, avoiding traditional computer based behaviours, in order to make the interface itself simpler. The minimalistic design has been instrumental in obtaining the simplicity. A third issue about light-weight technology has to do with providing a continuous availability of Saxaren, i.e., leaving it on and having it as the only application running on the computer. In contrast to the intranet used, users of Saxaren do not need time consuming login procedures for observing whether something new has happened.

Second, we have focused on aspects such as passing by and peripheral awareness. Any time during the day, when the teachers are on their way to or from a class, they pass by Saxaren. In all the units Saxaren has been installed in a strategic place where the teachers, by a glance and in the peripherality, can see if something is new. They do not have to make an explicit decision about finding out if something new has happened. Instead, as they pass by Saxaren, they will become aware of new things. Different constraints in the units’ premises (teacher and pupil rooms) have made it difficult in some cases, but not impossible, to obtain such regular peripheral awareness.

Third, we have focused on the aspect of playfulness. The playful behaviour we have seen in Saxaren is also related to testing the technology in order to understand how it works, or “the play to make things work”. Members played with Saxaren in the early stages, when trying to make it work, and they coached each other on the prototype capabilities. We have emphasized this as “pleasant work to make things work”, as opposed to overhead, unanticipated, costly activities (cf. Bowers, 1994). We have done parts of “the work to make things work”: updating prototype versions, but left addressable parts to the teachers: discovering features, creating joking notes, cleaning up.

In Saxaren, informal communication is enhanced through the unobtrusive and tacit way of interaction with information from different units. The simplicity in the interface and usage of Saxaren, as well as the minimalistic design, also invites an informal interaction among the teachers. The playfulness and the peripheral awareness of what is new on Saxaren also stimulate the use of it as an informal communication tool. The communication is of a more social character than formal, i.e., it is an interactive shared space between the units, providing a feeling of belonging to the same community.

We have seen the teachers playing through Saxaren, teasing, borrowing “tools”, warning each other on formalities that they have to attend to, and sending sometimes elaborately handcrafted postcard-like greetings to everybody on occasions. With an even more personal touch, we saw a handwritten letter being sent to everybody, on a number of topics that accumulated over time, just like in the old days. Members also acknowledge explicitly that “the screen” has brought them closer together and they have expressed the wish to keep it for good. While we cannot be certain at this early stage that we managed to strengthen the community, the informal contact between the teachers, the mutual help, the feeling of togetherness are early indications, which support that hypothesis.
Let us try to enumerate the aspects, which we think have contributed to this strengthening, in order to draw design implications on how to do such IT design better. First, we will emphasize play, as described above. Whenever a new community tool is introduced, there will be a need for a warm-up period. The activities in that period can help in bringing people together by challenging them to engage and play with the tool, through the features of the tool itself. Thus, we feel that “the play to make things work” can contribute to strengthening the community.

Along with playing with the prototype, we have seen play through the prototype. People used the prototype features, especially with drawings, to show their appreciation for their peers in ways in which e-mail and other text-based tools cannot accommodate. After approaching “the screen”, the perspective of sending a nice drawing away by a single pen tap can be a good incentive to spend some time on the drawing. While some of the playful “postcards” sent have shown a certain “formality”, that would have been seen in their paper counterparts, it is quite clear that such postcards would never have been written, stamped and dropped in the postbox, or not even attached to an e-mail. Members thus played with the meaning of a postcard, rendering it to be playful and informal, because Saxaren let them do so. They thus had other opportunities to send wishes to their peers on the next island, and they happily took them, in one case even after the holiday that normally offers such opportunities, just to wonder whether the holiday is over. Support for play and informality is yet another design implication for community strengthening.

Saxaren also provided a link between formal and informal, between community and organization, between what Brown et al. 2000 would call non-canonical and canonical. In some occasions the teachers preferred Saxaren before e-mail to notify their “neighbours” (as in a community) or colleagues (as in an organization) of the need to do something work-related, in the canonical, formal, organizational tool provided by the administrative entity (commune). While the links between Saxaren and the intranet are not supported at the technological level, and does not need to be, they were easily made at community level: simply “check the intranet” was used and everybody knew what it meant. Preferring to create a note instead of sending an e-mail shows that the pass-by availability of an always-on tool can be a valuable community resource: it is easy to access and one knows that the others will pass by.

In all, Saxaren has not made any revolutionary changes to the teachers’ work. They still use other communication channels, such as e-mail and telephone, to communicate with each other. The only change appears to be the usage of Saxaren instead of e-mail in some situations. The units have been more or less affected by Saxaren, i.e., using it more or less frequent. This makes it obvious for us to think about other, more active methods to support the usage among the units who have been more reluctant. Today, the best stimulation is the principal’s frequent notes about his whereabouts, meetings, information on the intranet etc. However, the notes containing greetings and work related information between the units, as well as their wish for keeping it are a significant sign of their appreciation of having Saxaren.

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