Evaluating a Telecare project

Case Study

Thuiszorg

Het Friese Land

June 2010

Dick Schaap – Assistant Professor - University of Groningen

This report is based on a case study written by students of the Master Course Business Processes and ICT as part of the programm.

The report has been approved by the organisation.

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1 Executive summary

Het Friese Land is an organisation in the province of Friesland providing Home Care services. In April 2009 a government funded Telecare project started. A group of 100 patients was selected, which were offered Telecare services at a distance on a regular basis. In September 2009 it was concluded that the project seemed to be successful but indicators to report to government were missing.
The management was interested in how to evaluate the project in a structured way.
Two students of the Master course Business Processes & ICT have investigated the appropriate business processes and in January 2010 submitted a report about the results.
They have investigated three core business processes: 1. the care procedure itself, 2. the time registration procedure and 3. the evaluation procedure. After modelling and analysing these business processes the findings indicated that although the care procedure itself was all right, the time registration and evaluation processes were not satisfactory. These processes were mainly manual processes or were not executed at all. And for the internal and external evaluations no norms were defined.
Options for improvement are an information system for logging and evaluation and a definition of indicators for well-being. A new business process integrating the care procedure, time registration and evaluation was designed and suggestions for implementation given.

2 Introduction

Thuiszorg Het Friese Land is a homecare organisation, based in Leeuwarden, providing care services to patients in Friesland, in the north of The Netherlands.
The number of people who need care is rapidly increasing (with an even steeper increase expected over the next decades) and the amount of people willing to work in the care sector gradually decreasing. Because this lack of capacity is already showing, the current treatments are minimal and leave little room for good quality (additional) service. Care providers have, in cooperation with the government, been looking into other means of providing healthcare, in support of the limited amount of physical care that will be available per patient. A promising development, with the potential of providing care to a larger audience using the same resources, is care from a distance, or, as it is more popularly known: 'Telecare'.

Thuiszorg Het Friese Land has started its own Telecare service in April 2009, called 'Zorg op Afstand' (Care from a Distance). The government provides support by means of the Screen-2-Screen programme, which means that until July 2010, patients will not incur any costs by participating in Care from a Distance.
When the service was first initiated, physical caretakers who work at Thuiszorg Het Friese Land were actively involved. When visiting patients, they were asked to try to interest their patients in Telecare, and were set 'sales targets' of connections that they were required to realize. However, it soon turned out that the physical caretakers did not see Care from a Distance as a good new service that would help them to ease their workload. Instead, they saw it as a threat to their current work, fearing that it would draw patients away from their physical care (there is currently no shortage of carers in the north of the country!). Further, the 'sales targets' meant that they did not take careful consideration in selecting patients who were genuinely interested in the service, or even fit for the. The goal was 'establishing as many connections', rather than 'setting up a useful service for interested patients'. This first wave of

patients was therefore relatively unsuccessful. Further, in the early days of the service, too advanced technical equipment was used.

It was therefore decided that the best way to communicate with the (predominantly old) patients would be by using one of the simplest models of the videophone. In July, a new initiative to sign up better patients was started, and letters were sent to qualifying patients. They were asked if they would be interested to participate in the Care from a Distance service, using a simple videophone. There were a lot of positive responses, and after in intake procedure, which included a visit to the patient's home to thoroughly assess if the service would be of use, 100 patients now use Care from a Distance. This number is deemed suitable at this time, and there are currently no plans to attract new patients to the service.

Care from a Distance is only available to patients who also receive physical care at least once a week from Thuiszorg Het Friese Land. By far the most of the patients of the service receive psychological care (80%), for example with dealing with loneliness, fear, or traumatic events. A smaller group of patients is aided with using medications and doing medical tests.

3 Problem statement

Care from a Distance has been operating for eight months and the first results are promising. The initial target of 100 clients has been reached, and there have been few cancellations of the service. Multiple patients have reported that they are very happy with the service and that it has brought them many benefits. Some even say that they find Care from a Distance more useful and helpful than regular care.

The government has granted money to the service until July 1st 2010, at which point it will reassess its decision, looking at the results that have been achieved. If the results are satisfactory, the government will continue to support Care from a Distance.
As the service has only been running for eight months, there still is some inefficiency in the daily routines. This is not the only problem with which we are concerned. At the moment, Care from a Distance has no evaluation procedure. Since the service has not been operating that long, this has not been a problem yet. However, as the government wants to assess the results, evaluations are likely to be necessary to provide information on the success of treatments, satisfaction of patients and the future of the Care from a Distance service.

Therefore, the research question we aim to answer is: '**How can Care from a Distance evaluate its service, and what suggestions can be done to improve the performance of the care process while implementing these evaluations?'**

We will first describe and model the current main processes, and then analyse where improvements and adaptations are possible. After that we redesign the process, and discuss implementation aspects. Finally, we will draw a conclusion and evaluate our research process.

4 Analysis

Care from a distance has a number of procedures (business processes) from which we select the most relevant concerning this investigation being: 1. care procedure, 2. time registration procedure and 3. evaluation procedure. These business processes are modelled using Actor Activity Diagramming and analysed afterwards.
The modelling syntax is given in Appendix 2. The methodology itself is explained at www.aadmodeling.eu.

4.1 The care procedure

The care business process begins with checking the agenda. Care moments in the agenda use a colour system: a blue colour means that the care moment is to take place, and a red colour means that the care moment will not take place (the reason of which can be found in the progress report).

Before a video call is made, the care center employee checks the progress report to take note of recent events. There is a direct link in the agenda to access the progress report of the patient. The progress report is a historic overview of calls that have been made to the patient in question. It contains an entry for every call and a small description of the details of the care moment. There are some complaints about the progress report: it is not conveniently organized and hence requires a lot of scrolling to read.

Further, the details that are stored are often not very relevant after a certain period. Therefore, the digital progress report is often emptied out if data is older than two months. Furthermore since the data is unorganized, it is hard to evaluate how a patient was doing a month ago without reading back through the entire history of often not so relevant facts.
Once the care center employee has read the most recent entries of the progress report, he/she calls the patient and delivers the care the patient wants. If the patient does not answer, the employee tries again in 15 minutes. If there is a technical error, the regular phone is used if the patient has one. During one of the interviews it was suggested that this way of handling trouble with reaching patients should be improved. For some patients (very senior ones for example), not answering the phone could possibly imply that there is an emergency. It has been suggested that some sort of urgency system should be used and action should be derived from that system if an employee cannot reach the patient at the agreed time.
To enter data about the care moment, the employee notes facts of the conversation in the progress report and closes it after the conversation is over.
Finally, the care moment should be registered on paper on a time sheet, so that records can be kept on when care was administered and for how long. There is some doubt about the usefulness of these time sheets. Filling them in after each conversation takes a lot of time, and the records are not used in any way. Records are kept ‘in case we ever need them’. Further, the way of filling them in: on paper using a cumbersome sheet, makes the process even more inefficient.

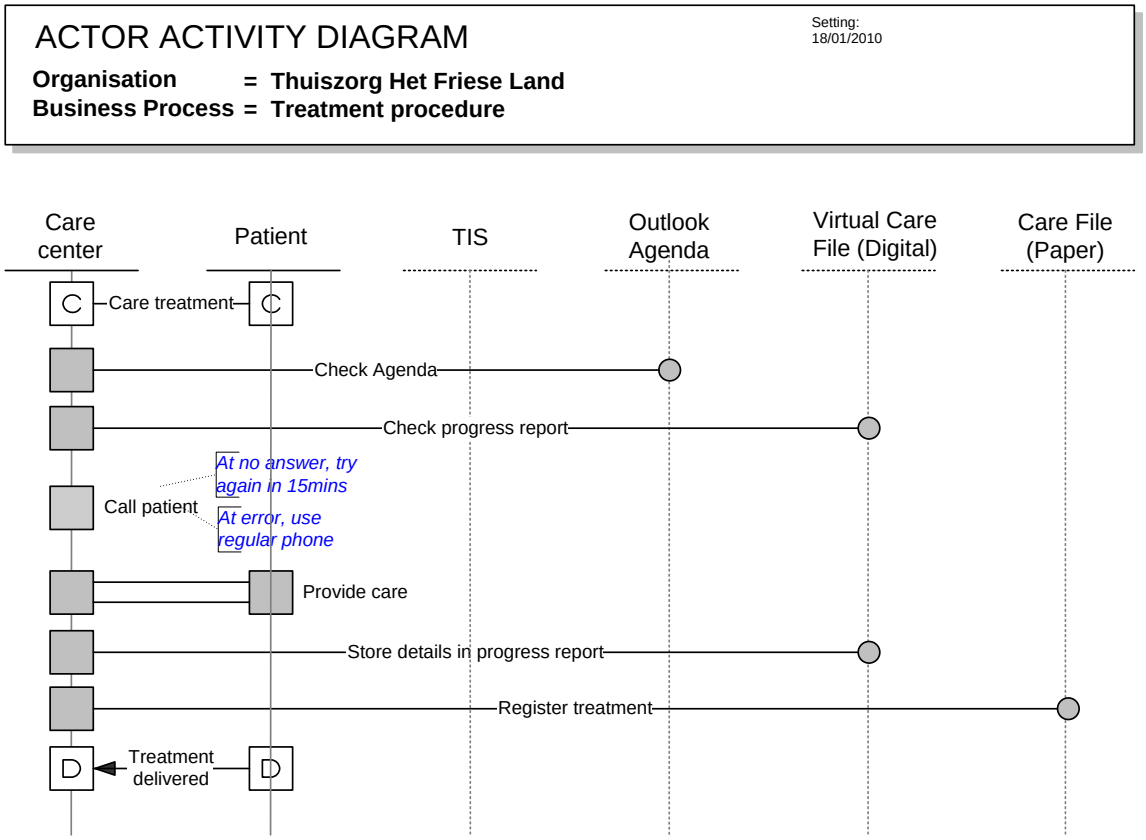


Figure 1: the care procedure

The table below summarizes our findings after analyzing the treatment procedure.

Agenda	Functions properly
Progress report	Contains too much irrelevant information, is not organized in an efficient way, and does not allow for easy interpretation of past events
Answering procedure	Lack of an urgency system
Care	Functions properly

Table 1: Summary of findings of the care procedure

4.2 The time registration procedure

Below, we have modelled the time registration procedure. Once a week, the hour registration forms are collected and passed on to the data entry department of Thuiszorg Het Friese Land.
As mentioned before, the forms are currently not used in any way. Other than a waste of effort, this is causing a lack of interest in the forms. While it is understood that the records may be used in the future, there is no real incentive to handle the forms as carefully and accurately as possible. Some employees are even trying to save time by filling them all in upfront or all in afterwards. While the time saved is of course very useful, it is questionable whether the time registrations are still accurate and hence useful this way.

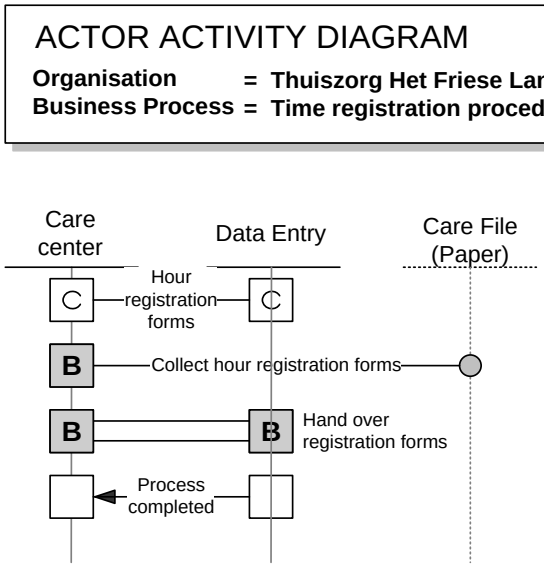


Figure 2: AAD of the time registration procedure

The forms have to be filled in on paper, using information from the electronic agenda. At data entry, the paper form is then digitalized again. This is of course not effective.
Furthermore, the time registration forms require a lot of redundant data to be entered (written!) by employees, which is very time consuming; doing this digitally would save a lot of time. Lastly, gathering and sending the forms digitally will also save time.

The table below summarizes our findings after analyzing the time registration procedure.

Filling in forms	Not used, not accurate, time consuming
Collecting and sending forms	Time consuming

Table 2: Summary of findings of the time registration procedure

4.3 The evaluation procedure

Below, we have modelled the evaluation procedure. Every six months, evaluations are to be conducted with patients and appropriate action, such as changing the treatment or the amount of treatments, is to be taken from the results of the evaluations.
The first thing we note is that this is the procedure as it is outlined in documents that we have studied during our visits. However, six months have gone by, but no evaluation has yet been conducted.
As we have seen, internal evaluation of the treatment is difficult at best. Therefore, external evaluation with the patient seems like a good starting point, but this has not been done either. In fact, there is no agreement over the evaluation form that is to be used. Further, there is no system in place that indicated that it is necessary to evaluate (since six months have gone by since the patient signed up).
Evaluations are needed for two reasons: to offer better treatment to patients and to be able to prove the use/need of Care from a Distance to ensure new funds to continue the project. Without evaluating, or measuring, it is impossible to indicate how well the project is performing. This will have to change.

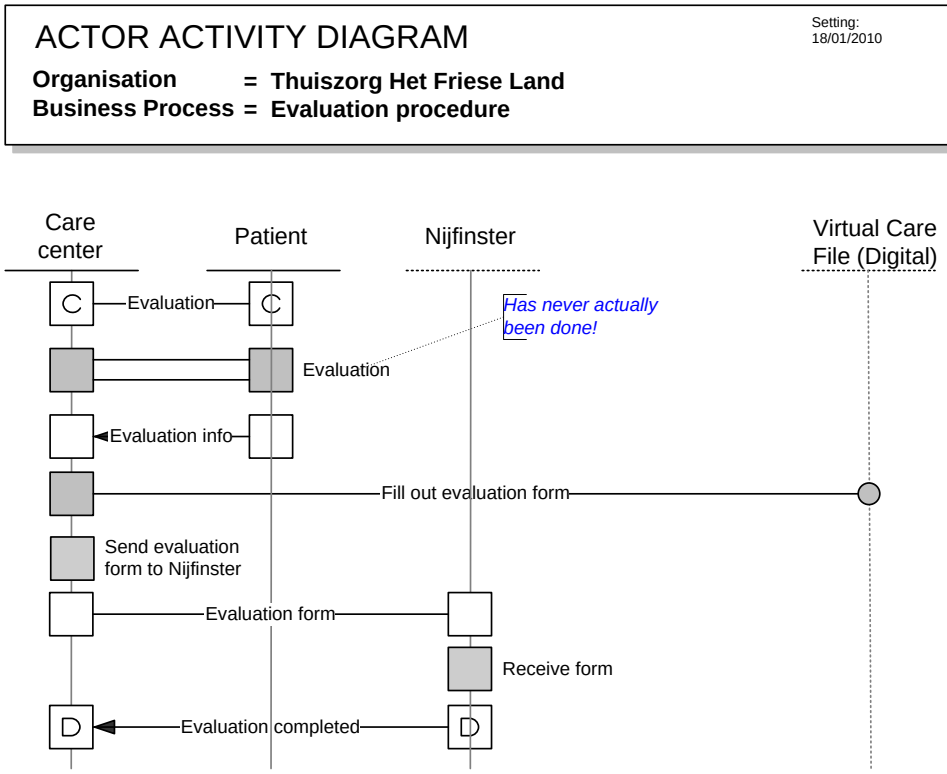


Figure 3: AAD of the evaluation procedure

The table below summarizes our findings after analyzing the evaluation procedure:

Evaluation procedure	Existing, but not used
When to evaluate	No indication system
External evaluation form	No agreement over content
Internal evaluation	Not done; difficult with current progress report

Table 3: Summary of findings of the evaluation procedure

4.4 Conclusion of the analysis

From our analysis we can conclude that the care procedure itself is very solid. Patients are called according to an agenda using a videophone, care is delivered, and the time and events are registered.

However, some improvements in each of these steps are possible.

1. The logging of events in the progress report is inefficient and does not allow for easy interpretation later on.
2. Furthermore, time registrations are seen as a necessity with little use, and not much attention is paid to then, limiting their use.
3. Evaluations are currently not performed, neither internally, nor with patients.
4. Lastly, an urgency system has been proposed. Not as a need, but rather as an enhancement.

Therefore, there is ample room for improvements to the process. In the next section, we will redesign the process. We will propose changes and additions to the current procedures to make them more effective in the future, and to allow evaluations to be conducted in the future.

5 Redesign

In this section, we will propose solutions to the issues we have outlined in the last chapter. We will address each issue separately. Then, we summarize our proposed redesign into an integrated solution.

5.1 Urgency system

If a patient does not answer the videophone at the agreed time, and calling back in 15 minutes yield no results either, this can mean different things for different patients. Some may have forgotten to tell they were out, gone to bed early, etc. However, for very senior patients who don't leave the house, or for patients who require help taking essential medicines, not answering the videophone is a more worrying situation.
During our last visit, this topic came up in an interview. In some situations, employees undertook actions themselves, sending someone over to check on the patient, but there are no set routines for dealing with these situations. One employee argued for an urgency system, categorizing patients into groups and deriving a course of action based on this. The following three categories were proposed:

Category 1: Undertake no action; no immediate danger
Category 2: Contact friend/relative to check on patient; patient is not self-sufficient
Category 3: Send physical carer over; not answering is usually a clear signal of danger

The category can either be listed in the patient's Outlook agenda entry, or on top of the progress report. The AAD below outlines the new proposed procedure:

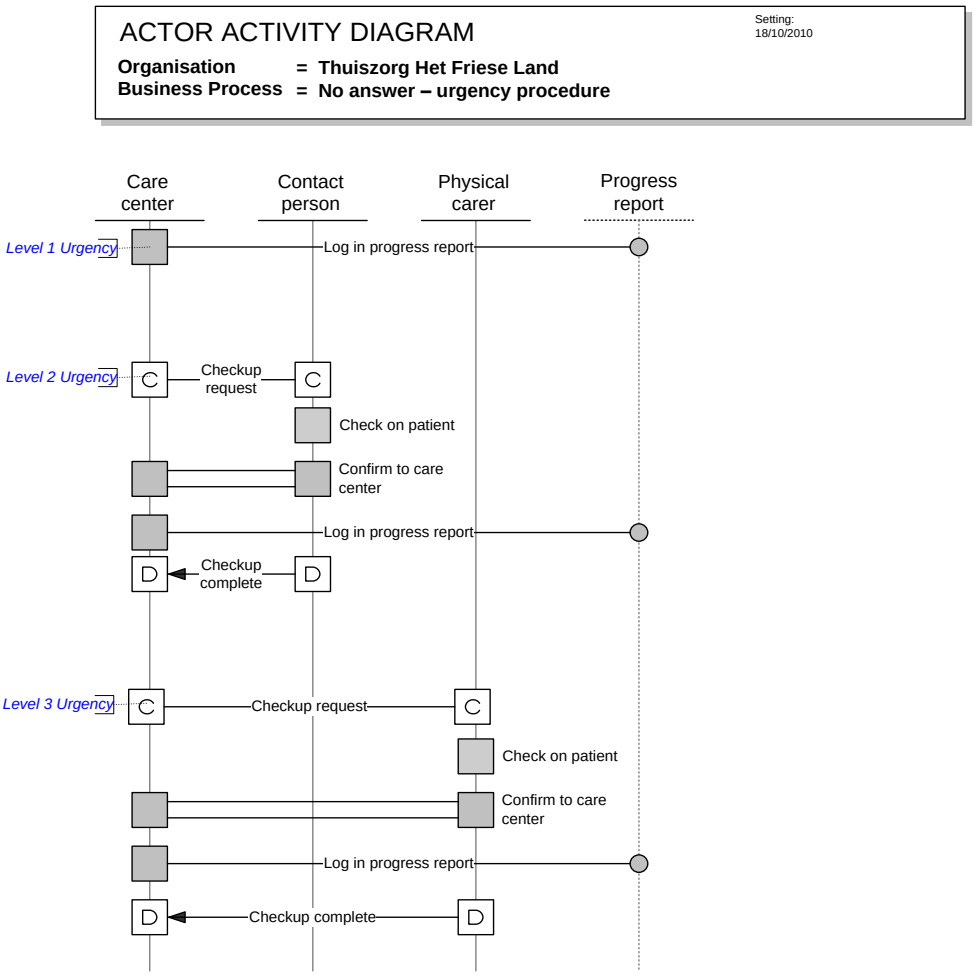


Figure 4: AAD of the proposed urgency procedure

5.2 Time registrations and the progress report

The progress report can be seen as a key part in making Care from a Distance aware of what it is doing and delivering. If the right information is stored in the right way, it will allow Care from a Distance to increase the speed of and quality of its treatments, digitalize the time registration and allow it to conduct internal evaluations.

A first and definite need that can be realized, without even changing the system used, is having the most recent entries at the top of the progress report, rather than at the bottom. This will save time and will enable the employees to store as much history as they want without decreasing the effectiveness of the file. We have already demonstrated how new fields can be added to the top of the document during our last visit.

However, to gain additional advantages, we recommend creating a completely new system for the progress reports. A system that has a database structure rather than a plain document structure. A database can link several types of data together and create useful overviews.

The database can help out in generating the time registration sheets. If the progress database has a log of treatments and their duration, and if the details of the patients are stored, the time registration sheet for a certain period can be generated on screen with a single button press, saving lots of time. Further, it is digital and can be sent to data entry in this way, saving them time too.

The outline on the next page illustrates how the database can combine data and generate new views. It also shows how the patient's personal details (including the new urgency detail) can be stored. Lastly, it shows how past treatments can be stored with the newest treatments on top, while the time registration can be done the other way around.
The shaded areas are copied from the progress report, and placed in their appropriate place in the time registration form.
Note that this outline does not cover all of the fields of the form used, but illustrates the concept.

Progress Report

Personal details:

Name:	Smit, Jan
Address:	Ketelstraat 1, 1234AA, Leeuwarden
Date of birth:	01 Jan, 1929
Patient number:	123456789
Treatment times:	Mon, 8PM Wed, 8PM Fri, 8PM
Condition:	Loneliness, general fear/worry
Urgency level:	2
Progress review:	Every first of the month

Care moments:

Date & Time	Duration (minutes)	Details of care moment
(New entry)	(New entry)	(New entry)
08 Jan 2010	5	Lonely weekend; happy to receive the call -> care moment is helpful
05 Jan 2010	6	No answer. Son was contacted; false alarm: went to bed early
03 Jan 2010	4	Nothing special
01 Jan 2010	5	Had visitors for new year's day -> happy, not lonely

Next progress review due: 1 Feb, 2010

Time registration sheet – Week 1, 2010

Date	Patient number	Activity	Duration
01-01-2010	123456789	Care from a Distance	5
03-01-2010	123456789	Care from a Distance	4
05-01-2010	123456789	Care from a Distance	6

Figure 5: Mapping of data from progress report to time registration sheet.

While this does not address the need for the time registration sheets (THFL has indicated that it wants to continue doing them), it does make it a lot less of a hassle to do them, and to do them properly. This is sure to be an improvement over the old way of working.

5.3 Evaluations and the progress report

The last issue with the progress report is the fact that the descriptions of the care moments may be relevant on the short term, but are hard to interpret as time goes by. If we wanted to assess how a patient was doing two months ago, we would have to read through a lot of (often irrelevant) details of care moments. In fact, since the progress report is improperly organized, the information that is older than a certain period (ranging from a month to longer, depending on the amount of care moments a week) gets emptied from the digital report and gets archived on paper.

During our research, two employees from Care from a Distance have drawn up a concept for the external evaluations and have visited four patients to fill them in. We have discussed the information gathered from these evaluations and have come up with three possible options to structure the evaluation procedure:

1. Conduct an internal and an external evaluation separately
   This is the easiest way: Care from a Distance evaluates its treatment internally and makes changes as they see fit. Further, they conduct an external evaluation with the patient and draw separate conclusions from them too.

2. Conduct and external evaluation, then use this information to conduct the internal evaluation
   This is a more complex way of evaluating, but is also more effective. First, the patient's opinion of the treatment is collected. This opinion is used for an internal evaluation. The aim is to compare the external evaluation with the internal evaluation and if necessary take action to optimally serve the patient.

3. Conduct an internal evaluation, then use this information to conduct the external evaluation
   This is the most complex, but also the most effective way to evaluate. The process starts by conducting an internal evaluation. Then, armed with this knowledge, we can maximize the effectiveness of the external evaluation. Patients often don't really know what to say during an evaluation. By identifying possible topics of discussion from the internal evaluation, it is possible to extract useful information from the patients by asking focused questions aside from the regular questions. An added advantage of this approach is that it is possible for Care from a Distance to compare the results from the internal evaluation with the opinion of the patient. This allows Care from a Distance to set internal evaluation criteria that will help improve the treatment for the end-user: the patients.

In the next chapter, we will argue which of these options is the most favourable one to implement. All of them make use of internal as well as external evaluations.
During our research, an external evaluation form was drawn up by the employees and is currently under review by management. The employees have more experience on which questions are likely to contribute to the best evaluation, so we have left this to them.

As we have argued before, the progress report has to undergo changes to make it fit for use during the evaluations. For a swift evaluation, it is critical that the information stored in the progress report is compact, relevant, and allows for easy interpretation. At the same time, the progress report must allow details to be stored, so that analysis of special moments during the care process can be done during the evaluation.

To maintain the best of both worlds, we propose a **new reporting system**, again using the database-structured progress report to store the history of care moments. This new reporting system will work as follows:

1. Care moments will be registered and detailed as before, paying special attention to details concerning the well-being of the patient. If a change in well-being is noted, it is logged in the progress report, including a reason why this change has occurred. It is important not just to list facts, but to also *relate a fact to a change in behaviour/well-being*. Since the knowledge is fresh during the actual care moment, it is important that relevant information is stored as quickly as possible, before it is forgotten.

2. Once a week/month/other period (this depends on the amount of contact moments the patient has each week, which can range from 1 to 10), the progress report of that period is read, and a conclusion is drawn on the well-being of the patient. The progress report for that period can then be archived.
   The factors that are to be rated differ per patient. For a patient that requires mental support, spirit may be an important factor, while for a medical patient health is more appropriate. These factors are best established by the employees of The Friese Land, as they have experience with healthcare and the patients.
   It is not the intention to give patients a mark for their well-being (for example: patient X scored a 6 on health this week). Instead, the well-being of the patient is to be compared to the last check. An increase/decrease is noted by +1/-1 (or more in the case of a significant increase. This way, it is possible to benchmark the progress a patient is making. This periodically created report will be called the ‘progress review’.

3. Once every six months (the system will indicate this at the bottom of the progress review), the progress is displayed by the system as a graph and can be analysed. Conclusions are drawn from it. The treatment is adjusted according to the results that are achieved. They can also be coupled with the results of the external evaluation, as we have outlined earlier.
   The fields on the bottom half of the page allow for additional information to be added, like special event or actions undertaken during the period that can explain a change in well-being.

The next figures illustrate the proposed changes.

Progress review – December 2009

Personal details:

Name: Smit, Jan
Address: Ketelstraat 1, 1234AA, Leeuwarden
Date of birth: 01 Jan, 1929
Patient number: 123456789
Treatment times: Mon, 8PM Wed, 8PM Fri, 8PM
Condition: Loneliness, general fear/worry
Urgency level: 2

Factors of well-being:

Feeling of loneliness
Fear when going to sleep
Fear when going out

Factor of well-being	Rating last month	Increase / decrease in well-being + main reason	New rating
Fear of loneliness	-2	High increase; has had visits from his son and is expecting more visitors soon.	0
Fear when going to sleep	4	Increase; only twice this month	+ 5
Fear when going out	2	Decrease; has been reluctant to go out lately; only when strictly necessary	+ 1

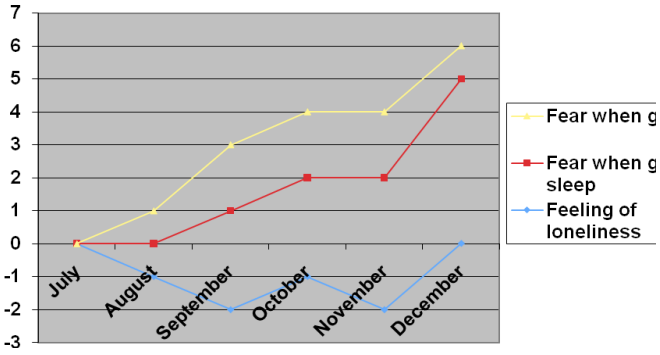
Next evaluation due: December 2009 [This month!]

Figure 6: Layout of a progress review

Internal evaluation: July 2009 - December 2009

Personal details:

Name: Smit, Jan
Address: Ketelstraat 1, 1234AA, Leeuwarden
Date of birth: 01 Jan, 1929
Patient number: 123456789
Treatment times: Mon, 8PM Wed, 8PM Fri, 8PM
Condition: Loneliness, general fear/worry
Urgency level: 2



Factor - Fear when going out
- Fill in special reasons for certain increases / decreases –
- Fill in special actions undertaken by Care from a Distance, if any -

Factor - Fear when going to sleep
- Fill in special reasons for certain increases / decreases -
- Fill in special actions undertaken by Care from a Distance, if any -

Factor - Feeling of loneliness
- Fill in special reasons for certain increases / decreases -
- Fill in special actions undertaken by Care from a Distance, if any -

Figure 7: Layout of an internal evaluation report

5.4 Integrated redesign of the progress report

We have argued for a new progress report using a database structure. The new progress report will address the problems with the current system in the following way:

1. By storing more personal details of the patient and registering the duration of treatments, the time registration forms can be generated by the database and digitally sent to data entry.
2. The personal details can also contain an urgency rating, which will be used to derive appropriate action in case of trouble while trying to reach the patient for a care moment.
3. Lastly, the new way of registering events during care moments will allow the employees to rate the well-being of a patient over a period of time (ranging from a week to longer, depending on the amount of care moments). These ratings can then be used to evaluate once every six months and adjust the treatment accordingly.

In the next chapter, we will discuss the implementation issues that will have to be dealt with when adopting the new progress report system. In this chapter, we will also argue our choice for one of the three evaluation approaches we have described.

6 Implementation

Implementing the new database-based progress reporting and evaluating systems lead to some changes in the procedures that are currently used.

6.1 Changes in the procedure

The addition of the urgency system does not introduce much change. Rather, it structures the current way of working by further detailing procedures, rather than to let employees act at their own discretion.

The next procedure that is added is to assess and archive the progress report after a certain period of time and to make the progress review. This can be done with the time saved doing the time registrations. However, the evaluation procedure will have to be added too. The evaluations are listed in the current procedures, but have not been performed yet. Since they will be performed now, time will have to be found to do them. Some of this time can be found by the time saved doing the time registrations, but this will likely not be enough to make the progress reviews and to do the evaluations. Since Care from a Distance would like to evaluate, they will have to add extra capacity to realize this goal.

The introduction of the new database system does, however, not represent a completely different way of working. Care moments are still administered according to an agenda and the details are still stored in a progress report. Further, the database will look and feel very similar to the systems that were used up till now. What has been added is the fact that evaluations will now be performed, as should be the case. The employees will have to be taught how this system works, but we have taken care in devising our solution such that in-depth technical knowledge is not needed.

The biggest difficulty with switching to the new database is to switch from the old record-keeping system to the new one. There is an enormous record of information that is only stored in the paper care file. Further, the information in these progress reports is unorganized and often not very relevant. Working through all of it would take an exceptionally big amount of time.
Therefore, we have conferred with Care from a Distance during our last visit on how we would start to use the new system. It was concluded that importing all the old data into the new system would be too time-consuming and would offer little benefit in comparison.

The course of action that was agreed upon is to start with an external evaluation to get an understanding of how well the patient thinks the treatment is going. This will be the starting point for the progress review. New records will be kept in the new system from that time onward. During the switching phase, the paper records may still be used, but they can be phased out in a month as the progress report in the database starts to build up. Once the established time has gone by for a patient (ranging from a week to a month or more), the first progress review will be made up using information from the new progress report and the transition to the new system will be complete. Then, after six months, an internal evaluation can be done, based on the progress reviews that have been made.

Effectively, this approach means that when the system is implemented, Care from a Distance will start with a clean sheet and start collecting information on treatments in a more systematic way. The information collected to this point will not be used, but will be summarized by an external evaluation conducted with the patient. This decision has been made since it is believed that the current information stored in the progress report is not valuable enough to warrant the effort required to restructure it.

6.2 Combining the internal and external evaluations

Earlier, we proposed three options for combining the evaluations. We will repeat them here.

1. Conduct an internal and an external evaluation separately
2. Conduct an external evaluation, then use this information to conduct the internal evaluation
3. Conduct an internal evaluation, then use this information to conduct the external evaluation

We argued early that the third of these options will yield the most valuable evaluation.
In the redesign phase, we have seen that internal evaluations can effectively be drawn up using the data from the progress review, which in turn uses information from the progress report. The internal evaluation does not rely on the patient. Thus, it is technically and practically possible to conduct the internal evaluation before the external evaluation, and use its information to conduct a more effective external evaluation. The patients can be helped with providing more useful information, which will be mutually beneficial.

Since the internal evaluation also contains fields for special events, actions and circumstances, these can be compared against the results from the external evaluation (and thus the patient's opinion). This will yield valuable insight into how effective the treatment really is and how it should be adapted.
Now that we have chosen our evaluation approach, we can draw up the new AAD of the core process, outlining the new core process that we are proposing.

ACTOR ACTIVITY DIAGRAM

Setting:
18/01/2010

Organisation = Thuiszorg Het Friese Land
Business Process = Proposed new treatment process

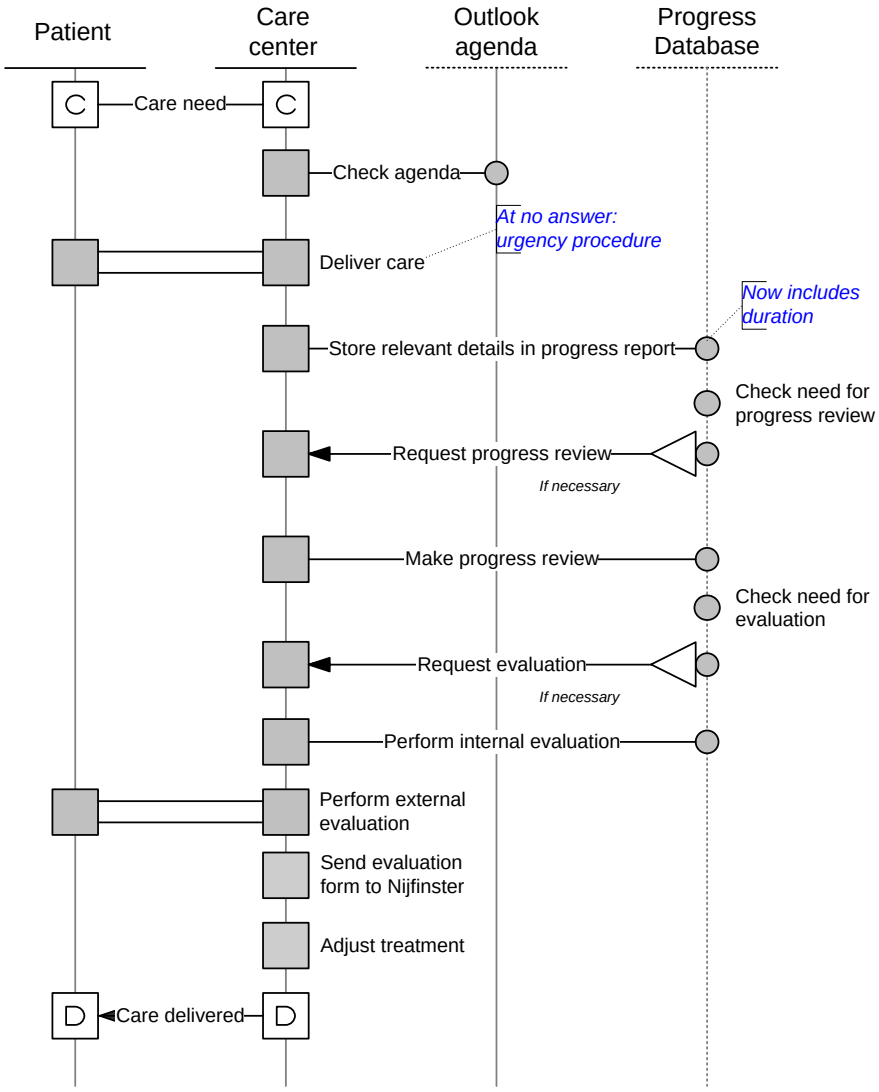


Figure 8: AAD of the redesigned core process

7 Conclusion and evaluation

During our research, we have proposed a solution, which will enable Care from a Distance to evaluate its treatments. Further, we have proposed some additional adaptations to improve the care process.

The core concept of our proposal is to implement a database that will handle the progress reports from now on. The database will allow Care from a Distance to save time with time registrations, to keep track of progress using the 'progress review', and to conduct graphically supported internal evaluations, which can be used as input for the external evaluation. Further, the database supports the new urgency system. The database will be the integrated solution that will allow Care from a Distance to vastly improve all of its record keeping.

Implementing the database will mean a fresh start for Care from a Distance. The old progress report will be phased out in a month, and the old records will not be used anymore. Instead, the starting point for the new system will be the input from an external evaluation that is conducted with the patients.

There are some restrictions to our research.

1. We only looked at the core procedures that are used. However, we have identified and modelled all of the other procedures. Since the other procedures rely on the progress report and the progress report will not change, we don't expect any trouble for the other procedures. However, we have not analyzed or improved the other procedures any further; this can be done in future research.
2. A second restriction is that we have not actually developed the system. We have made a proposal for the system and have demonstrated the basic mechanics of it, but it has not yet been realized. The Friese Land has its own IT department. It will be up to them to decide to what extent our proposal is feasible.
3. Lastly, we lack the healthcare expertise to determine of the internal evaluation system is really as straightforward as we have outlined it. The internal evaluation may have to be adjusted by health experts to capture the essence of keeping track of well-being conditions. Care from a Distance has accepted our offer to offer further aid in deciding on the content of the internal evaluation. Since the specific content of the evaluation does not fit in the (time) scope of this research assignment, we have not been able to include this in our report.

We believe that the ideas and suggestions we have made in this report will be valuable for Care from a Distance, even if the system is not implemented in the way we have proposed. If the ideas in this report are realized, perhaps in an altered form, we are certain that Care from a Distance can vastly improve its record keeping and evaluation and will be able to demonstrate that they will be able to demonstrate the added value of their Telecare initiative to any and all who takes an interest in it.

8 Participants

This case is a product of an external project assignment as part of the Master Course Business Process & ICT for the Academic year of 2009/2010 given by Dick Schaap. The external project assignment was dedicated to innovation in healthcare.
The project has been executed by Jan Willem Koek and Gumala Warman. They had a number of interviews with several people at different levels of the organisation. Their results have been discussed in class. This case study is a summary of their full report.

9 Appendix 1 – Business processes

Care from a Distance has a number of procedures, for which we will provide a brief description below.

1) Signup procedure
A preliminary planning of care moments is made, the signup form is received and handled, and preparations are made for the installation of equipment.

2) Installation procedure
The installation request is received by the equipment installer, it's installed and tested at the patient, and an agreement to initiate the service is signed.

3) Treatment and registration procedure
Care is provided and the care moment is registered. Every week, time registration forms are submitted. Lastly, twice a year, evaluations are to be performed.

4) Technical problems procedure
A patient reports a technical problem. An attempt is made to fix the problem. If this is unsuccessful, the equipment installer is contacted and the problem is fixed. The fixing is noted and service resumes as normal.

5) Temporary intermission of service procedure
A patient reports a temporary intermission, it is registered. When the patient indicates that he/she wants care again, this is also registered and service is resumed.

6) Changes in service procedure
A patient reports a change in service, it is registered. If applicable (for example if the patient is moving), equipment installers are contacted. After this, service is resumed.

7) Termination of service procedure
A patient requests termination of service. This is registered and the equipment is collected. A final evaluation is conducted and the file is closed.

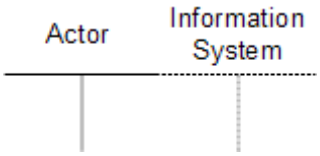
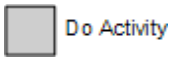
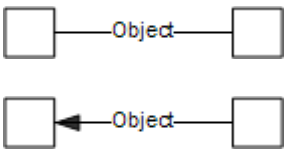
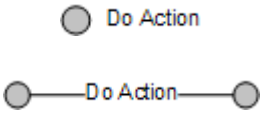
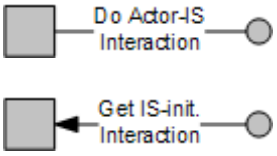
In the interest of our research, we will only take a closer look at the treatment and registration procedure, including the evaluations. These procedures are most used by Care from a Distance, which means the potential benefits that can be gained will be great. We will refer to this set of procedures as the "core process".

Actor Activity Diagrams of these business processes are available at d.j.schaap@rug.nl

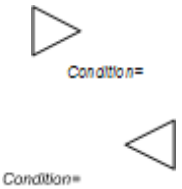
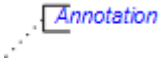
10 Appendix 2 – AAD syntax

In this section the graphical elements of Actor Activity Diagramming are defined divided into three categories: basic elements, supporting elements and worksheet elements.

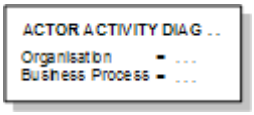
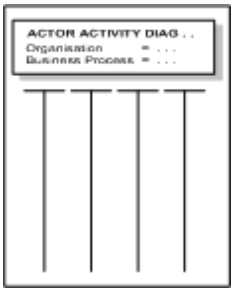
Basic elements

Actors are persons that are executing work. Actors are represented by vertical lines. Business processes enrol along these lines from start to end. Information Systems also are considered to be actors, but are represented by dotted lines to express their programmed role.	
Activities is work that is done by human actors. Activities are represented by little grey squares with text explaining the work. The activities add value to the products or services in progress.	
Transactions represent the transfer of objects, i.e. the products or services in some state from one actor to the next. In backwards transactions an arrow is used to stress the reversed flow. Note: this transfer is a shift in responsibility, no actual work is done.	
Actions are a set of programmed instructions performed by Information Systems. Actions are represented by small grey circles with text explaining the action.	
Interactions are Actors communicating with Information Systems or vice versa. Interactions between Information Systems and Actors are backwards and represented by an arrow.	

Supporting elements

Conditions can be used to split paths in a business process. Conditions only are used in an horizontal way: that is with transactions or interactions. Conditions are represented by a white triangle in forward or backward directions with text explaining the condition.	
Annotations are used to add a comment to an element. The comment might address an issue for discussion or improvement.	
Connectors are used to connect to the next page of a business process drawing. This page then in turn opens with a connector.	

Worksheet elements

Title blocks are to be placed at the top of worksheets to identify business process, organisation and further details like author, date, and source.	
Worksheets are used to draw Actor Activity Diagrams. Worksheets should contain a title block and as many Actors as needed. Customers are to be positioned at the left side and Information Systems at the most right side. Portals can be placed second from left.	

Source: http://www.aadmodeling.eu/