

# Voorstel voor Open Standaard / Open Source oplossing voor telecare.

Rob Kleissen, 30 september 2008

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## Inleiding

Dit document beschrijft heel kort de kern van een Open Standaard / Open Source oplossing voor gebruik in innovatie van chronische zorg. Vragen, commentaar, suggesties, en andere vormen van feedback zijn van harte welkom. Stuur me een mailtje via het contactadres van [opentelecare.org](http://opentelecare.org).

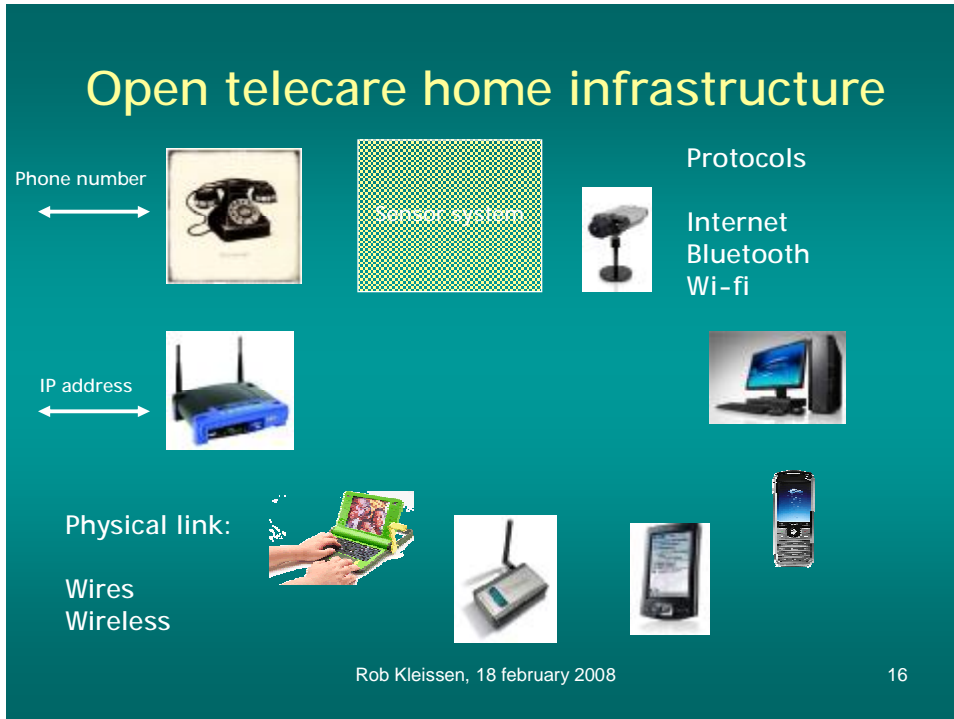
## Wensen voor de oplossing

Voor het verplaatsen van zorg naar de thuisomgeving is communicatie van allerlei gegevens met zorgverleners op afstand essentieel. Dit kunnen professionele zorgverleners zijn, maar ook mantelzorgers. De oplossing is zoveel mogelijk diagnose onafhankelijk. Die gegevens zijn 24 uur per dag, 7 dagen per week probleemloos toegankelijk voor de cliënt zelf, voor mantelzorgers en voor zorgprofessionals die werkzaam zijn bij verschillende organisaties. De gegevens zijn van elk denkbare locatie in te zien, ook voor personeel dat bij de cliënt thuis komt (medewerkers eerste en tweede lijn). De cliënt kan contact leggen met anderen elders om problemen te melden, oplossingen te bespreken en advies te verkrijgen. De oplossing staat gebruik van telefoon, text messaging, e-mail en video toe als dat nodig is. Ook tele- en zelfmonitoring van biomedische parameters zoals eeg, bloeddruk, zuurstof saturatie is mogelijk. De resultaten van registratie van deze parameters kunnen ook worden gedeeld met anderen. Tot slot ondersteunt de oplossing gebruikersvriendelijke toegang tot materiaal waar de cliënt van kan leren. De oplossing verstoort het dagelijks leven van de cliënt zo weinig mogelijk. Waar mogelijk worden draadloze verbindingen gebruikt. De cliënt bepaalt wie toegang krijgt tot de gegevens. Bij transport van de gegevens zijn privacy, integriteit van de gegevens en beveiliging tegen afluisteren gewaarborgd.

## Schets van de oplossing

Bij de diagnosegroepen waar het om gaat worden thuis compacte, gebruikersvriendelijke meetsystemen geplaatst, waarmee de cliënt een aantal medische grootheden registreert

die van belang zijn voor keuzes in het behandelproces. Bij COPD zouden dat bijvoorbeeld de zuurstof saturatie en longfunctie kunnen zijn. Bij manische depressie kun je denken aan de Lithium concentratie in bloed. Dit meetproces is vergaand geautomatiseerd. In figuur 1 is dit meetstelsel weergegeven met het blokje “sensor systeem”. Aan de hand van de figuur wordt duidelijk wat er verder met de geregistreerde informatie gebeurt.



*Figuur 1: Technische infrastructuur voor Open Telecare thuisbehandeling*

Voor alle diagnosegroepen geldt, dat er een registratie systeem gebruikt wordt, dat zo ontworpen is, dat het past binnen de telecommunicatie infrastructuur die de facto al in veel huishoudens aanwezig is. Met “huishouden” wordt in dit verband de dagelijkse omgeving van de patiënt/cliënt bedoeld. Dit kan ook de vakantiebestemming zijn van een client. Dit registratie systeem is aangegeven met het blokje “Sensor systeem”. Of een huishouden nu een desktop, laptop, palmtop computers thuis heeft, of het huishouden al een local area netwerkje heeft of niet, of dat netwerk draadloos is, of bekabeld: in alle gevallen past het sensor systeem in deze infrastructuur.

Verder gaat de oplossing ervan uit, dat elk huishouden beschikt over een telefoonaansluiting. Deze telefoon zorgt voor een betrouwbare spraakverbinding die nodig is om probleemloos met anderen (mantelzorger, zorgprofessional, lotgenoot, enzovoort) te kunnen praten. Of dit een mobiele of een vaste telefoon is maakt voor het functioneren van de oplossing niet uit.

De thuis geregistreerde gegevens zijn van buiten toegankelijk via het IP adres dat aan het huishouden is toegekend. Gegevens worden gedeeld via een virtual private network. Ze worden beschikbaar gemaakt met behulp van web-services. Bijvoorbeeld: Wanneer de zorgprofessional het verloop van de zuurstof saturatie gedurende de afgelopen week van de cliënt wil zien, dan verzoekt hij met de webbrowser van de computer op zijn bureau om toegang tot een webpagina op de webserver bij de cliënt thuis. De professional krijgt de grafiek dan te zien op in zijn webbrowser scherm. Gelijktijdig kan hij/zij via de telefoon praten met de cliënt over wat er aan de hand is, en keuzes maken t.a.v. de behandeling.

Deze webserver is geïmplementeerd op een computer systeem dat draait onder open source software. Dit systeem staat bij de cliënt thuis, bijvoorbeeld in de meterkast . Het is compact en energie zuinig. Het systeem is 24 uur per dag, 365 dagen per week beschikbaar. Dit computersysteem heeft daarom voldoende tijd om allerlei andere intelligente taken te verrichten: bewaken van meetprocedures, verwerken van gegevens, genereren van reminders, enzovoort..

Voor toepassingen waar video beelden noodzakelijk zijn, kunnen netwerkkamera's worden toegevoegd aan het systeem. Daar waar video niet nodig is, blijft de camera achterwege.

Op deze manier ontstaat een zeer goedkope en modulaire oplossing , die de patiënt/cliënt vrij laat in de keuze van de onderdelen van de oplossing. Deze oplossing is ontworpen met als uitgangspunt: *onafhankelijkheid van leveranciers van producten en diensten ("provider lock-in")*.

Belangrijk is op te merken, dat de geregistreerde gegevens *niet worden verstuurd* naar een centrale data base bij een service provider. De gegevens zijn gegenereerd bij de cliënt thuis, blijven daar ook, en zijn *blijvend het eigendom van de cliënt*.

De cliënt bepaalt wie toegang krijgt tot de gegevens en wie niet doordat hij de controle heeft over gebruikersnamen en wachtwoorden die nodig zijn voor toegang tot het systeem.

## **Technische ondersteuning van de client**

De technische ondersteuning en beheer van het meetsysteem en de server-in-de-meterkast gebeurt op afstand door een organisatie die daartoe bevoegd en bekwaam is. Ook reserve kopieën van de gegevens bij de cliënt thuis worden door deze organisatie gemaakt en beheerd. Ook het beheer van het noodzakelijke virtual private networking gebeurt door een gekwalificeerde organisatie.

## **Open Source / Open Standaard Software**

De software die gebruikt wordt in het server systeem is beschikbaar onder de GNU General Public Licence. De documentatie bij deze software is beschikbaar onder de GNU Free Documentation Licence. Communicatie tussen systeemdelen maakt gebruik van open communicatie protocollen zoals TCP/IP en Bluetooth.

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