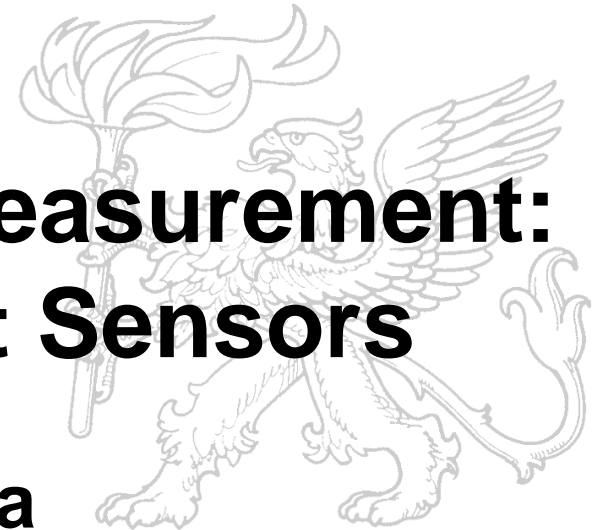


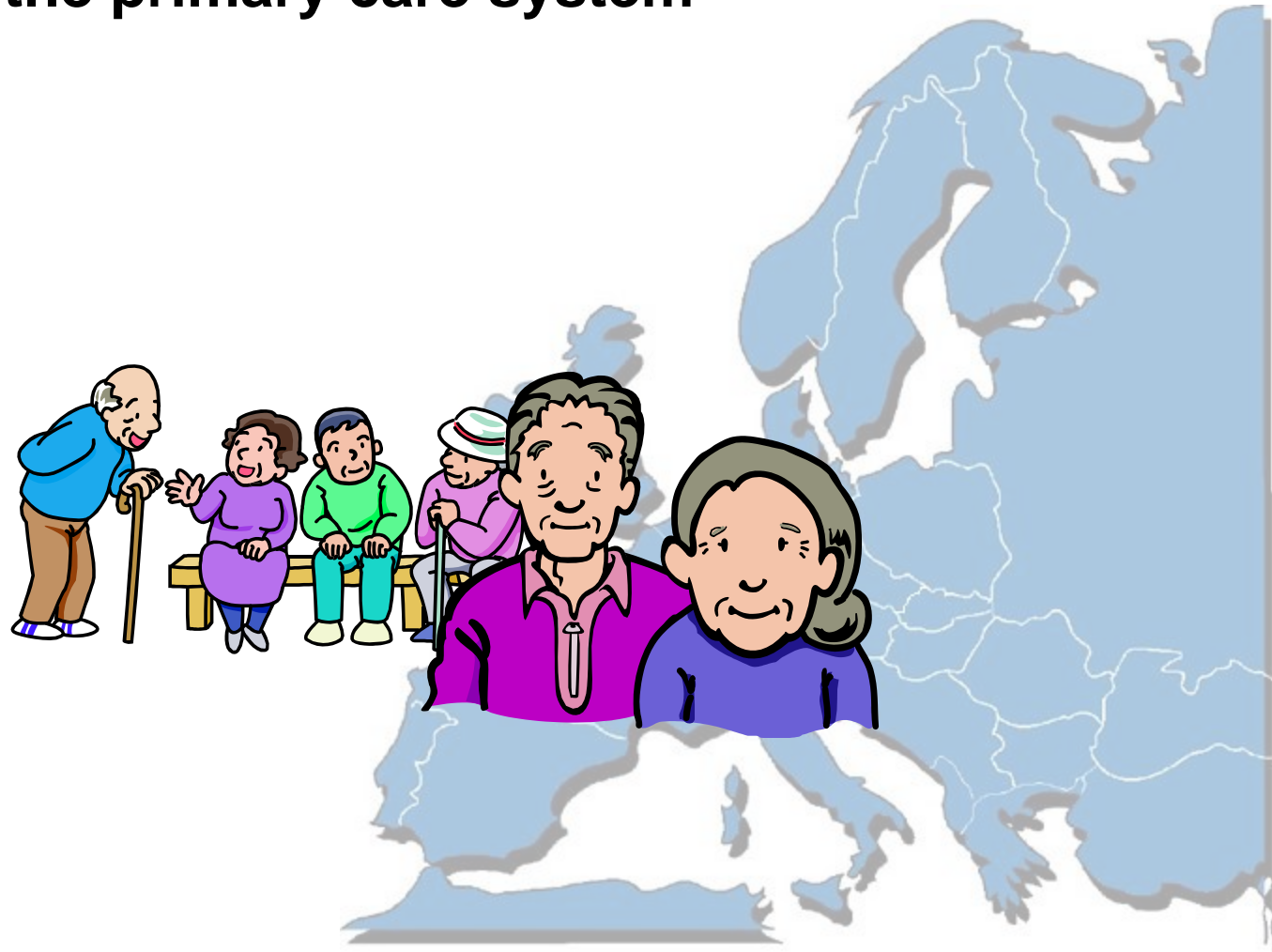
Passive vs. Active Measurement: The Role of Smart Sensors

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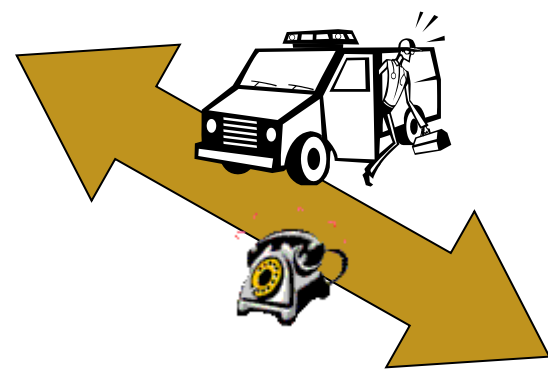
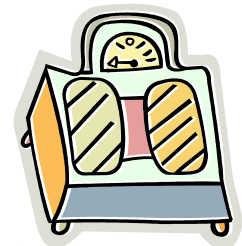
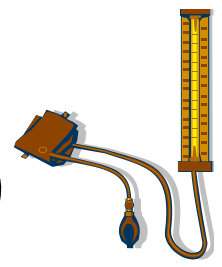
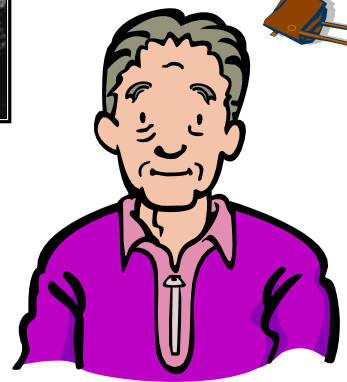
Western society is aging and there is an increasing pressure on the primary care system



With the availability of smart devices connected via fast network connections new methods emerge for replacing existing ways of healthcare



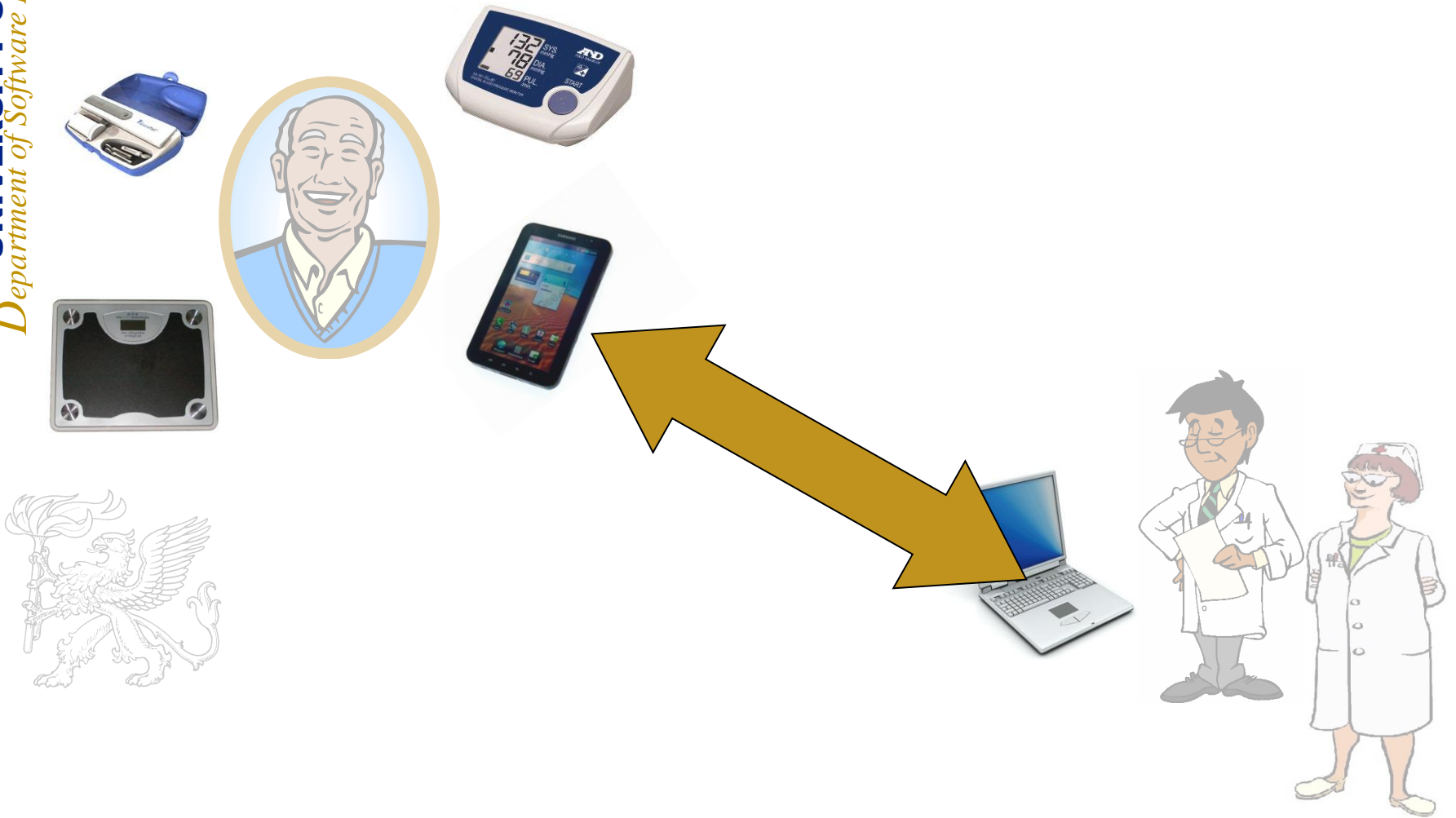
Traditional healthcare methods are error-prone and the patient-doctor feedback cycles are long



Computer-assisted home healthcare solutions can ease handling of illnesses and lead to secure life-conditions

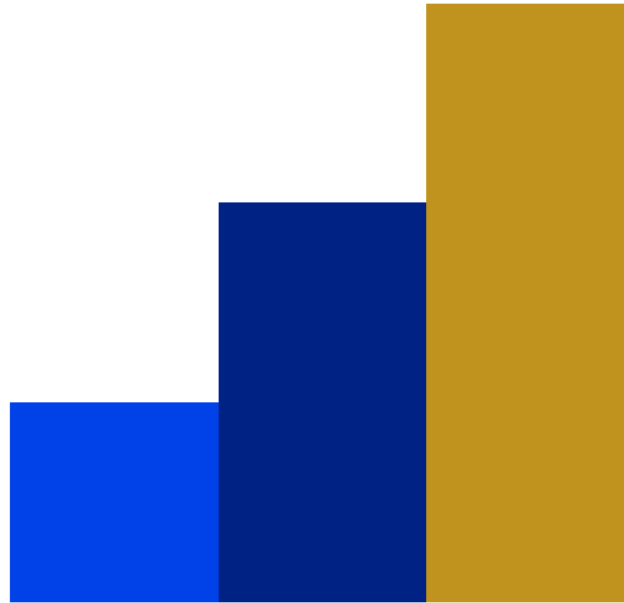


Flexible and fault-tolerant IT-systems based on smart sensor devices can frame the backbone of the home health-care in the 21st century

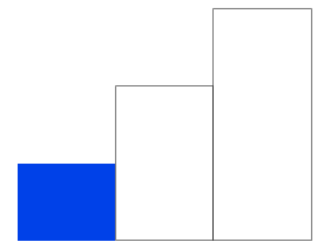
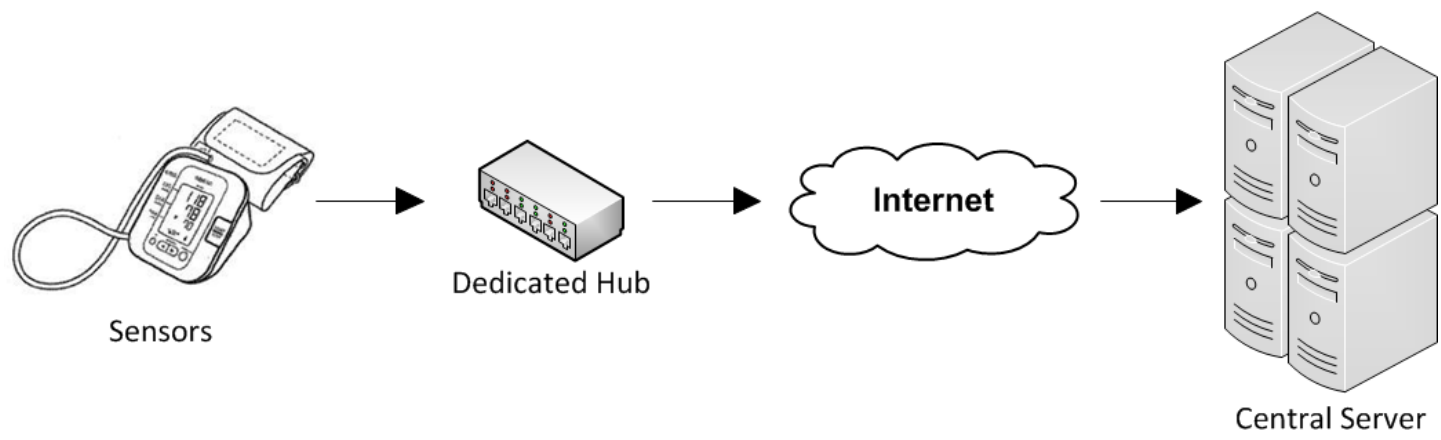




We implemented three different solutions of increasing complexity – all of them based on smart sensors

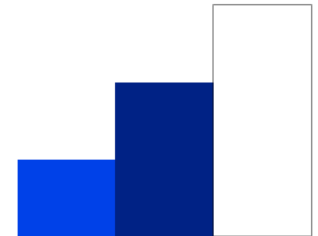
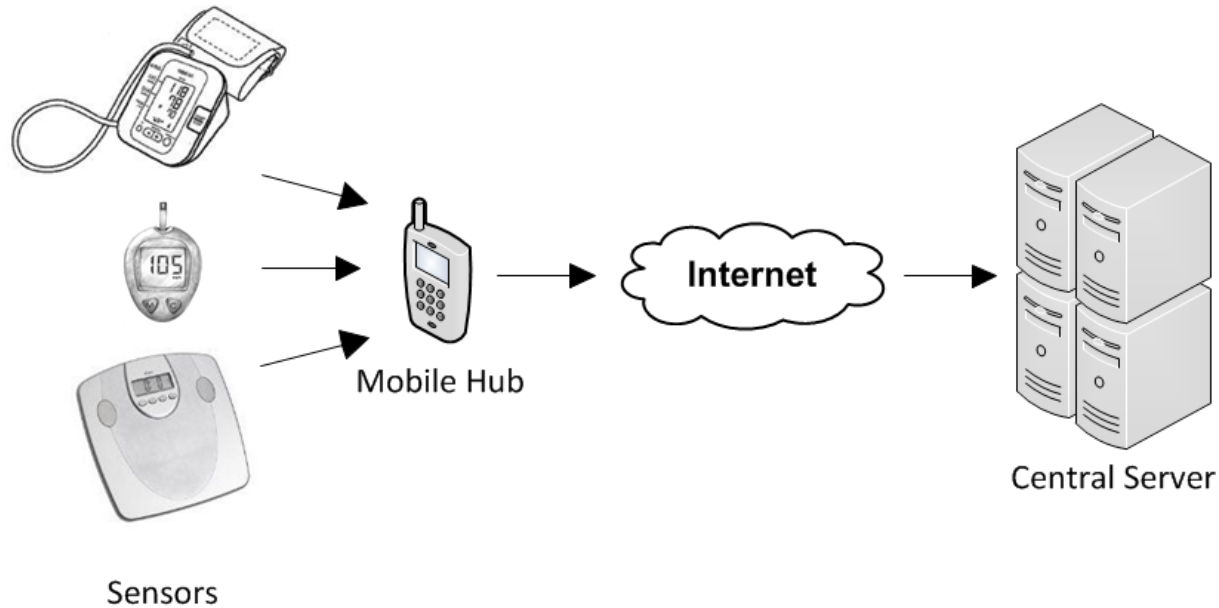


The *Medistance* system utilizes a simple *dedicated data-forwarding HUB*

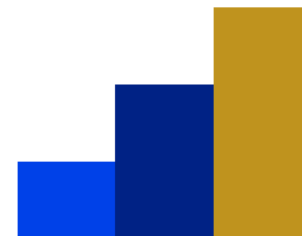
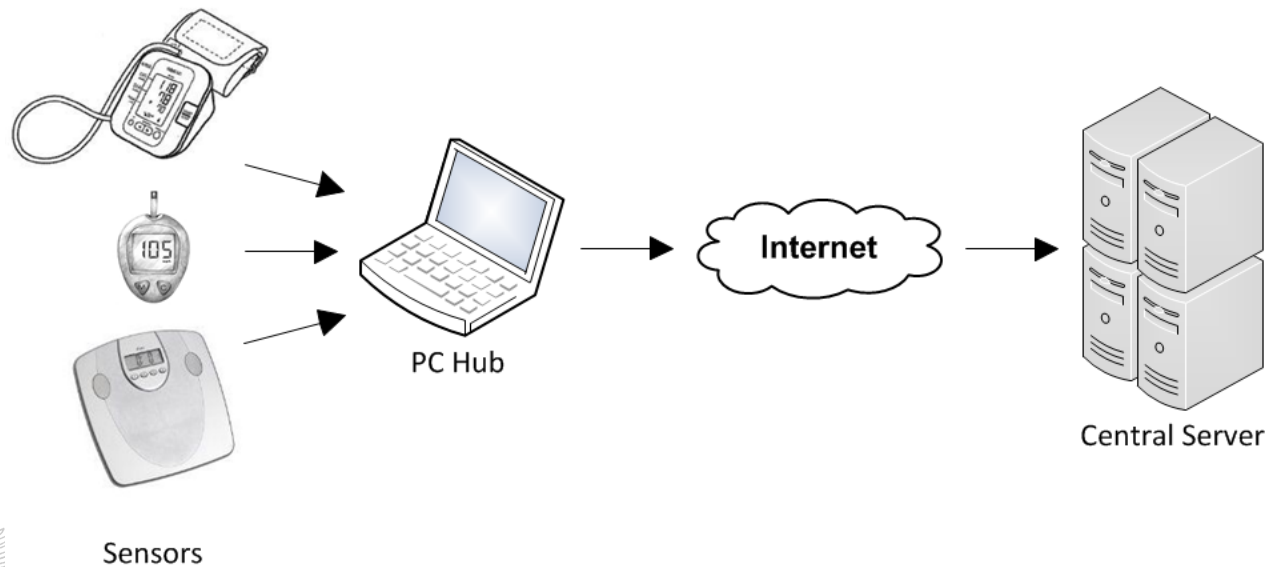




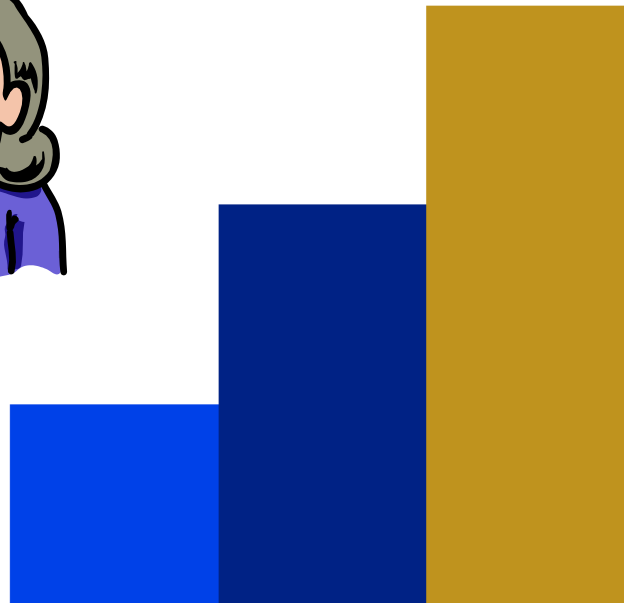
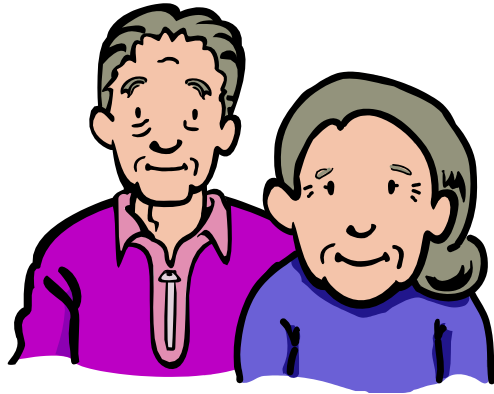
In the *Telenor EDH* system a smart phone serves as a mobile *HUB* with smart functions



A PC-compatible device serves as a *smart HUB* and a *touch screen sensor* in the *ProSeniis* project.

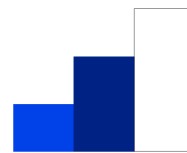
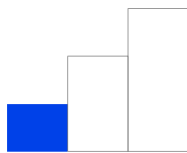


We organized clinical tests on all 3 different systems

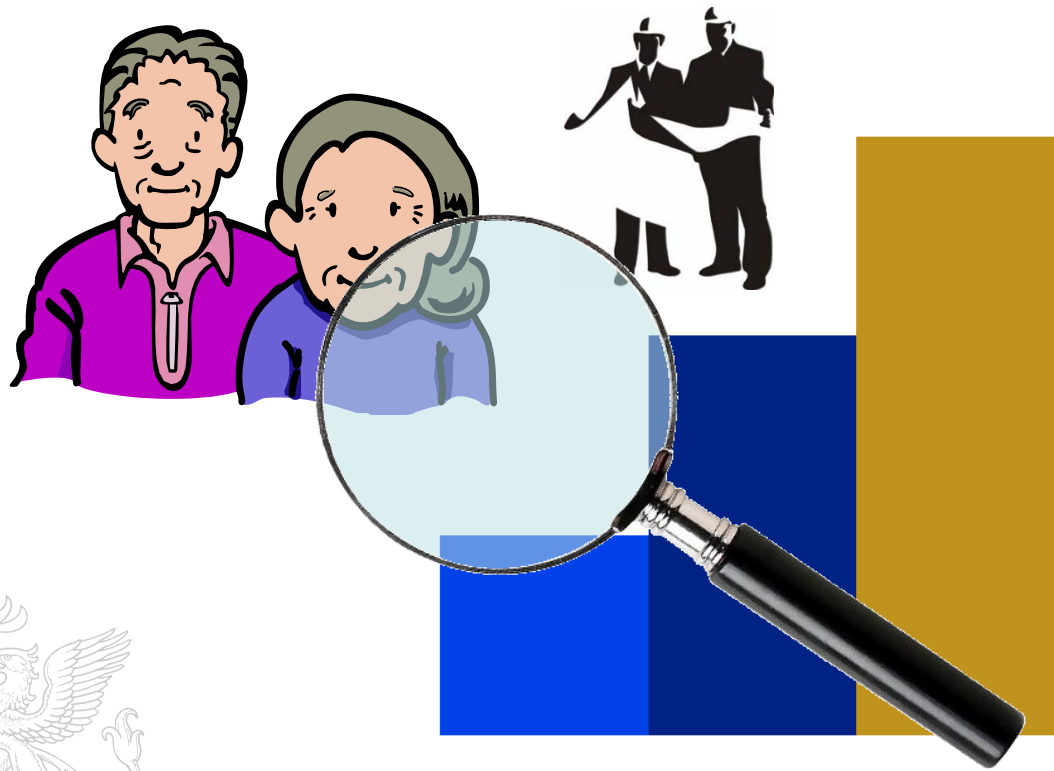


Methodology of measurements

Medistance	Telenor EDH	ProSeniis
<ul style="list-style-type: none"> Patients suffering from hypertension 	<ul style="list-style-type: none"> Patients suffering from diabetes Patients with different heart conditions Patients suffering from hypertension 	<ul style="list-style-type: none"> patients are suffering from mild/moderate dementia stroke survivors Parkinson's disease
<ul style="list-style-type: none"> Omron blood pressure monitor Medistance data transfer hub 	<ul style="list-style-type: none"> Low-end Nokia smartphone Motorola high-end smartphone Dcont blood glucose meter A&D UC321-PBT weight scales TensioDay TD3 blood pressure monitor 	<ul style="list-style-type: none"> Intel Health Guide A&D UA767-PBT blood pressure monitor A&D UC321-PBT weight scale Bayer Breeze 2 blood glucose meter
<ul style="list-style-type: none"> Blood pressure measurement twice a day 	<ul style="list-style-type: none"> One daily blood glucose measurement Weight measurement: every morning Blood pressure measurement: every morning 	<ul style="list-style-type: none"> Blood pressure measurement once a day Body weight measurement once a day



We investigated how the patients used the systems and drew some interesting conclusions





Results compared: willingness

System	Measurement	Min.	Avg.
Medistance	Blood-pressure	137%	198%
EDH Symbian Nokia phone as Hub	Blood-sugar	24%	114%
	Body weight	42%	81%
EDH Android Motorola phone as Hub	Blood-pressure	95%	176%
	Body weight	91%	134%
Proseniis	Blood-pressure	30%	159%
	Body weight	12%	127%

Conclusions

The type of measurement and the types of illnesses they are related to

- ▶ *„Patients suffering from heart problems are more willing to do blood-pressure measurements on a daily basis than they are to do weight measurements at the same rate.”*



Whether the measurement is directly visible at the Hub's user interface

- ▶ *„The weight sensor initiated the measurement process and the users were able to accept the data upload but no other function was to be interacted with for a successful result.”*

Conclusions (*continued*)

The device role that is used to initiate the measurements

- ▶ „*Measurements of higher complexity enjoy smaller willingness levels*”
- ▶ „*The LL got negative feedbacks from users exercising the longer procedures due to complexity*”



Whether alerts help the users to remember the required measurements

- ▶ „*The willingness results do not show that the measurements initiated directly from sensor devices have higher willingness levels*”

Conclusions (*continued*)

Presence of alerting service

- ▶ „availability of alerting service did not play a role, at least with regards to willingness”
- ▶ Selected patients are all aware of their illnesses



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**Thank you for your kind
attention!**

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