

SAPHE

Issue : Public Release 1.0

Document Reference: D03a_pub

Author: Nigel Barnes (BT)

Date: 21st August 2007

© SAPHE Project – January 2008

Table of Contents

Table of Contents	1
1 Introduction	2
1.1 Document Status.....	2
1.2 Document Overview.....	2
2 SAPHE scenarios.....	3
2.1 General Care Process/Generic Scenario.....	3
2.1.1 Phase 1: Provision.....	3
2.1.2 Phase 2: Operation.....	4
2.1.3 Phase3: Withdrawal.....	5
2.1.4 Evidence Base.....	5
2.2 SAPHE Vision scenario.....	5
2.3 Brief SAPHE scenario narratives.....	7
2.3.1 Activities.....	7
2.3.2 Falls.....	8
2.3.3 Clinical.....	8
2.3.4 Medication	9
2.3.5 Reassurance and Information	9
3 Document History.....	11

1 Introduction

1.1 Document Status

This document, based on contents within the internal SAPHE Deliverable D03: Service Usage Scenarios, has been approved by SAPHE project management for public release.

1.2 Document Overview

This document has been prepared by the SAPHE Project Partners to provide an initial overview of potential SAPHE functionality and operation shown through usage scenarios. It simply presents the scenario narrative outputs of the Scenario Usage Scenarios work package. Accompanying public documents outline the prior analysis of events taken from existing scenarios (*D03b_pub*) and the methodology for scenario development (*D03c_pub*).

2 SAPHE scenarios

2.1 General Care Process/Generic Scenario

Specific scenarios in the subsequent section detail processes relating to specific events which occur once the monitoring service is in day-to-day operation. Prior to this it is necessary to consider the generic care process for new service user enrolment onto a SAPHE system.

The generic process consists of three phases:

- Phase 1: Provision
 - Enrolment and profiling
 - System installation
 - Service commencement
- Phase 2: Operation
 - Non-priority contact
 - Priority contact
 - Maintenance
- Phase 3: Withdrawal
 - Termination of service
 - Decommissioning

Each of these phases is described below.

2.1.1 Phase 1: Provision

Enrolment and profiling

A service user who meets the selection criteria is referred for enrolment on the service. The service is explained to the service user and informed consent is granted for their involvement in the trial.

An initial profile of the service user is created; this includes identifying the specific conditions for monitoring, and all the relevant stakeholders. From this initial profile a detailed technology assessment is carried out to define the sensor (body, ambient, periodic) and network connectivity requirements.

Note: profiling and enrolment may take place during the same contact.

System Installation

Installation of ambient sensors and point measurement devices in the service user's home. The service user may also be supplied with body worn sensors at this stage. Full training and instruction (including frequency of readings) is given to the service user and the end-to-end system is verified before going live.

As part of the system set up carers are also provided with interfaces to the system and are given sufficient training and instruction. Metric thresholds will also be agreed at this stage.

Service commencement

1-2 weeks after installation a review is carried out to verify system integrity and to ensure the expected data is being captured. At this stage the normal monitoring service begins. This incorporates data capture from sensors together with the transmission, storage and analysis of the data. Data will be available to the relevant stakeholders and alerts and alarms will be issued by the system.

2.1.2 Phase 2: Operation

Non-Priority Contact

The form of contact is dependent on the prevailing circumstances. For the service user these may include:

- Issue a reminder that an event or appointment is due. For example reminding that a medical examination is due or that sensors need to be worn for a particular period.
- Issue an automatic warning that an event or appointment is overdue.
- Issue a warning that a non-priority alert has been triggered and that some action should be taken in accordance with the user's action plan.

Other stakeholders will receive other forms of contact for example:

- Periodic summaries of data
- Reminders to contact the service user

Additionally both the service user and other stakeholders will have web-based access to data. This may include educational content to assist with condition management.

Escalation and Priority contact

When a situation is causing repeated contacts, a non-priority alert has not received an appropriate response from the service user or a priority alert is issued then escalation occurs. Escalation in the first instance is to generate an alarm to a call-centre based social worker (?). Based on the information available to the call operator they will be in the position to decide on the appropriate course of action. The operator will have access to protocol to provide guidance on the appropriate action. This action, dependent on the specific situation, may involve:

- A telephone call to the service user. This may involve advising the service user to contact an appropriate primary or acute medical service.
- A telephone call to a locally based informal carer.
- Telephone contact with emergency services.

2.1.3 Phase3: Withdrawal

Termination of service

Data collection and monitoring of the service user will be ceased following the receipt of a request for the service to be terminated.

Decommissioning

All provisioned equipment will be de-installed and removed from the service user's home. The result of any sensor fitting etc. within the home will be made good (e.g. filling of drill holes in walls).

2.1.4 Evidence Base

The generic scenario is based upon the care process used in the Liverpool Telecare Pilot and that seen in commercial chronic disease management (CDM) platforms.

2.2 SAPHE Vision scenario

The following scenario provides a vision for the use of a SAPHE system with an individual service user. The scenario was developed for the SAPHE 'Vision Statement and Executive Summary'.

Bill is a 71 year old male living in Liverpool on his own. His two grown up children, Linda (50) and Liam (48) both live reasonably close by but both work full time and have their

own families to keep them busy. They tend to drop in on Bill once a week each. Bill suffers from Dementia and COPD but is strongly independent.

Three months ago Bill had two minor falls. Each fall involved overnight hospitalisation, and led to Linda visiting more and more often as she became very worried about her father's ability to cope with his conditions. Linda took Bill to his check up appointments but he rarely talked to the doctor when he was there and left all the talking to Linda. Linda found this difficult as she didn't know the exact pattern of her dad's symptoms as well as he should himself. The problem was that Bill could not recall his symptoms and behaviours from day to day or at worse from hour to hour and it has already proved impossible for him to maintain a journal as his doctor had first suggested.

Linda believed that Bill was unable to regulate his behaviour; on 'good' days he would overexert himself whereas on 'bad' days he will just sit in front on the TV and will barely eat or drink.

Linda wished there was a way both her and Bill could somehow record or remember his symptoms and how they get worse or better over the day, or even a full week or month before they visit or speak with the doctor again. Even June, Bill's home help, has mentioned to Linda that she is often unable to determine if it is a good day or a bad day for Bill and such information would help her to schedule when best to visit and whether or not to make him something to eat when she arrives.

The doctor agreed he would like to build a better picture of Bill's changing symptoms to help him decide how to manage his conditions better and reduce his risk of further falls which would have resulted from his fluctuating behaviour. The doctor referred Bill onto his PCT's SAPHE system which was installed soon after.

The installed SAPHE system non-invasively monitors Bill's activity within his home at all times via small sensors in each room. Bill's breathing and SpO2 are also monitored via discrete wearable sensors and a small unit he wears on his belt during the day and docks on his bedside table at night-time. His home carer assists him with checking the wearable devices each morning and night although, if prompted, Bill can manage them himself now.

For the last two months the technology has provided Bill's doctor with a longitudinal record of Bill's physiology and correlated behaviour with key trends and episodes highlighted. This has allowed the doctor to adjust Bill's medication plan to be more appropriate and he has set the system to issue phone based medication reminders due to Bill's forgetfulness.

Access to summaries of Bill's status and daily activities are also provided to Bill's community matron, Debbie, and to Linda. With more detailed information Debbie is able to better schedule care visits to Bill's needs and can closely monitor his activity levels and events to ensure he remains safe at home and determine early signs of possible health problems. For instance, last month Debbie noticed that Bill was waking up several times in the night and earlier in the morning amounting to only 5 hours of sleep a night. On closer review it was seen that these episodes were accompanied by a drop in Bill's oxygen saturation and a rise in heart rate at rest. Bill was diagnosed with a chest infection (he is more prone to this because of COPD) and what was waking him up was him getting short of breath during the night. The early diagnosis allowed treatment of the infection with oral antibiotics and prevented hospital admission. Information from the SAPHE system is also reviewed as part of the Multi-Disciplinary Team patient reviews that involve Debbie, the GP, and hospital clinicians. The system makes sharing information between the individuals much simpler.

Linda is reassured by the simple daily summaries she receives of her father's status and that she will be alerted if a cause for concern is detected such as a possible fall. She continues to visit Bill regularly but now does so more out of enjoyment than concern. The fluctuations in Bill's well-being are now much reduced and he says he feels happier now than he has felt for some time.

Note: This scenario has been developed from the MATCH scenario 'Electronic Presentation of Chemotherapy Symptom Data'.

2.3 Brief SAPHE scenario narratives

2.3.1 Activities

Activity level

Mr. T developed pneumonia and kidney infection which lead to a change in his activity level, the SAPHE system detected this change and alerted a carer.

Leaving and returning home

Mrs Kent suffered from dementia and her carers were concerned she might be wandering at night and would have to be moved to residential care. The SAPHE system provided the carers with evidence that wandering was not a problem for Mrs. Kent.

Sleep

Carol's family were concerned that Carol could become unwell and lie in bed without asking for assistance. The SAPHE system was used to monitor Carol's sleeping patterns looking for trends and abnormal events which provided peace of mind to her family.

Toilet

Mr D developed an UTI, his SAPHE system alerted his carer of a change in his toilet usage and the UTI was diagnosed early, this meant that complications were avoided and his recovery time was much shorter than if the infection had not been treated so quickly.

Meals

Carol lived alone and her carer was concerned that on occasions she might lose her appetite and not be eating. The SAPHE system was able to reassure the carer that Carol's eating patterns were normal and her weight was being maintained.

2.3.2 Falls

Mrs B had a history of falling often she forgot to wear her pendent and was unable to summon help. A SAPHE system was installed which used a wearable sensor to automatically summon help if she fell. Occasionally she also forgot to wear the sensor but the SAPHE system also used environmental sensors to monitor her and raise alarms if she fell.

2.3.3 Clinical

COPD

Jim suffered from sever COPD and used a SAPHE system to ensure that he was effectively managing his condition. The SAPHE system provided his COPD team with long-term trend data which allowed them to adjust medication levels to allow Jim to enjoy as active a life as possible.

Weight and Blood Pressure

Carol's family were concerned she was getting elderly and her health was becoming an issue. The SAPHE system carried out vital sign monitoring together lifestyle monitoring to reassure her and her family that she was health and coping with living independently.

Temperature

Jack was lonely and sat watching TV for hours gradually cooling down. His wearable SAPHE sensor alerted a carer to the risk of hypothermia. The carer visited Jack to warm him up, they also looked at his SAPHE activity profile which showed that he was spending a lot of time alone watching TV. The carer spoke to his friend and neighbour who said that unintentionally they had not been visiting him as often as usual and would visit more frequently to help with his loneliness.

2.3.4 Medication

Since her GP changed her medication Carol felt continually tired but didn't want to put out the GP by telling him. However, he was able to use the SAPHE system which showed medication changes alongside activity levels to see that all was not well. He changed the dosage and Carol was able to return to her previous activity level.

2.3.5 Reassurance and Information

Information and reassurance to service user

Bill finds it difficult to remember his day to day symptoms. This could make managing his condition difficult as he can not recall his day to day symptoms for his doctor. However, the SAPHE system provides him with simple summaries which he can use with this doctor to effectively manage his condition.

Alarm and reassurance to service user

Jim's COPD had worsened and he was so anxious about his condition that he was restricting his life to stay in his home. This was making him depressed and so a SAPHE system was used to both support condition management and to provide real-time alarm monitoring if anything did go wrong. The reassurance the system provided freed Jim from the confines of his own home.

Reassurance to informal carer

Carol's family were concerned about their mother and used their SAPHE web interface to reassure themselves that she was ok and did not require their assistance. This allowed Carol and her family to discuss things other than Carol's health which made for far more enjoyable conversations.

Information to professional carer

A spell in hospital left Mr Smith disorientated and confused. The SAPHE system allowed him to return to the familiar environment of his home and at the same time allowed his care professional to keep a close eye on him and to create a personalised care package closely aligned with his needs. Without SAPHE Mr Smith would have had to go into residential care.

3 Document History

Issue	Date	Prime author(s)	Comments
1.0	02/01/2007	Nigel Barnes	SAPHE Internal: Document created from D03.
Public Release 1.0	21/08/2007	Nigel Barnes	Created for Public release.

End of Document