Assignment 3 - User Research

Group 10 - Seniors Managing Diabetes

Marc de Niverville

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1.0 EXECUTIVE SUMMARY

This report relates the findings of user interviews conducted according to the research plan put forward in Phase 2 of the project.

Two subjects were interviewed. Both subjects volunteered a lot of information that was helpful to developing a deeper understanding of what it means to have diabetes and what is required to successfully manage it.

The key insight obtained from the interviews was that they could establish an equilibrium of diet, exercise, and insulin boost. An established equilibrium enables very good quality of life and their prospects for long-term health are greatly improved.

A target user is identified, one who has been recently diagnosed with diabetes. It seems that this is an appropriate target, as their needs are more urgent and our system could target their learning curve to establishing the equilibrium.

The chosen scenario is the daily monitoring and planning activity as this is the means for establishing an equilibrium.

2.0 STUDY METHODLOGY

The study activities were strictly confined to conducting user interviews, of which two were performed. One of these interviews was conducted over the phone (hereafter referred to as Subject #1). Consent form approval was obtained from both, with Subject #1 providing a verbal agreement that was actually recorded at the start of the conversation. Both subjects agreed to having the conversations recorded.

Both subjects are elderly, have had quite different experiences of diabetes, and display different levels of computer competency. Nevertheless, this pool of samples is not representative of the general population of seniors managing diabetes for the following reasons: there is not a sufficient number of subjects in the sample; the two subjects did not report stress or "burn-out" in the managing of diabetes. This is apparently an attribute of representative samples of seniors that are managing diabetes, 65% of whom report stress and "burn-out".

Despite the flaws inherent in the study sampling, some valuable insights were obtained which will be helpful towards directing the design effort.

3.0 STUDY RESULTS

3.1 Description of the subjects' monitoring regimen

Subject #1 has been diagnosed with type 2 diabetes. Initially, they were monitoring their glucose on a daily basis, and their daily dose of insulin booster drug was several tablets. Today, they check their glucose only once in a few days and the daily dose for the insulin booster has dropped to a half a tablet. They do not do much exercise and recognize that they should be doing more, admitting that they lack the interest and motivation. They monitor their carbohydrate intake carefully, by total calories and by time of consumption.

Subject #2 has had type 1 diabetes for 70 years. They report having been a case of interest to the famous Dr. Best! At one time, they monitored their blood glucose levels indirectly by urinalysis. This method does not provide instant results, and only measures the glucose that has already been filtered from the blood. They have since switched to the Bayer Contour, which takes a direct glucose measurement from blood sampled by a finger-prick. This testing is performed twice daily.

Subject #2 will inject two different insulin preparations in the morning, one of which is a delayed-release formula. While the dose has not changed in quite some time, they must plan and monitor their carbohydrate intake carefully. Their activity levels during the day will have a significant impact on blood glucose, so that if the expect to play tennis or do any gardening, then they will plan their meals differently, and even ingest a shot of maple syrup ahead of a bout of exercise.

Carbohydrate intake has been stabilized by establishing routine menus for all the meals, and by obtaining an acute awareness of carbohydrates in each food item. By always shopping for and eating the same things, they maintain a base caloric intake of approximately 2,100 calories/day.

3.2 Devices in use

Subject #1 uses a desktop Windows PC for their proficient use of email and web browsing applications. The subject is not able to address computer configuration issues, so they rely on their son to perform IT support. This user also uses a feature phone for mobile communications. Interestingly, they do not recognize their glucose monitor as a 'technology device'.

Subject #2 has never owned a computer, nor used one for work. They have recently acquired an iPad, and is learning how to use email and the web browser. While they are excited about finding anything they wish on the web and exploring their interests, they expressed some frustration about the complexity of the multi-touch interface. This subject

demonstrated the use of their glucose monitor, and displayed a high degree of comfort and competence. They also did not recognize it as a digital device.

3.3   Support networks

Subject #1 reports that they meet with their physician once every three months or so. More extensive blood-work is performed on those occasions. The physician will interpret the findings of long-term glucose levels since the last check-up, and will recommend adjustments to their daily regimen. It is now that the prescriptions may get changed, that stern admonitions about exercise or diet may be delivered, or efforts to keep to the daily regimen are recognized and encouragement is offered to continue with it.

Subject #1 also reports that they met with a dietician on only one occasion, when they were first diagnosed with diabetes. They found this to be very helpful, as they were required to make rapid lifestyle adjustments and did not know how to begin.

Clinic staff at the physician's office provided the glucose monitor as well as the consumables for the device.

Subject #2 reports a similar relationship with their physician. They too must have the more extensive blood-work performed at 3-month intervals and meet with the physician to review the results and discuss any adjustments to the daily regimen.

Subject #2 was self-taught about the sources of carbohydrates, and began managing their diet long before carbohydrates became so prevalent in the North American diet.

3.4   Key insights

It is notable that both subjects did not report stress and burn-out from managing diabetes. Both subjects explained how they had achieved an equilibrium between the three key factors of diet, exercise, and insulin booster dose, and how they had learned to maintain this equilibrium. The fact that they have regular attention from health care professionals is undoubtedly a significant contributor to their success in managing their disease, but the credit of maintaining a daily regimen is certainly due to them alone. Given that they can maintain this equilibrium, they do not experience health crises, they can easily adapt to any minor adjustments required of their daily regimen, and their disease is not perceived as onerously impacting their lifestyle. (NOTE: This impact is one of degree, as in the case of Subject #2, it could be perceived to be significant to a person not used to their regimen.)

Achieving the equilibrium requires self-awareness, information, and the experience to make correct decisions based on both. Clearly this can be achieved without high tech equipment (as Subject #2 has successfully managed diabetes for 70 years), however, the use of blood glucose monitors such as the Bayer Contour has been a boon for people new to managing diabetes. Despite their significant experience, Subject #2 reports that the information provided is a reality check and can give them more confidence in their decisions.

The greatest benefit of this insight is in realizing what the purpose of a diabetes management system should be: it should help users lead happier lives by helping them achieve this state of equilibrium. This equilibrium is a prerequisite to a stable lifestyle and long-term health.

4.0 USER NEEDS LIST

If left unmanaged, diabetes can lead to severe complications and an early death.

From the point of view of someone newly diagnosed with diabetes, this person needs first:

- to stabilize the condition
- to learn how to obtain the required information that will be effective in managing diabetes
- the tools to obtain that information
- to learn how to interpret the information that they will obtain
- to learn how to make the needed decisions about their meals, their exercise, and their insulin booster dose

For someone who has stabilized the condition, this person needs:

- to establish the habits of a healthy daily regimen
- to obtain regular feedback on actual blood glucose levels
- the tools to obtain that information
- regular check-ups from a physician to ensure that long-term trends are in control

5.0 STAKEHOLDER DESCRIPTIONS

Family: if meals are shared with family, then their support is required to maintain a fat- and carbohydrate-controlled diet. If the spouse does the shopping and cooking, then they play a key role in implementing the diet plan.

Tech support for computing devices may also come from family members.

Friends were reported to offer tech support for computing devices. They were also relied on for understanding when their diet choices might conflict.

Health care providers are key in providing ongoing services for monitoring long-term blood-glucose levels and creating the daily regimen of diet, exercise, and insulin booster dose.

The **manufacturers** of contemporary blood-glucose monitors have enabled direct, reliable, and affordable monitoring of blood-glucose levels. This tool gives users the feedback that they need to check their state as often as they require to effectively manage the three factors influencing equilibrium.

6.0 USER PERSONAS

My choice of persona is based on my perception of the urgency of their need.

6.1 Jill

…has recently been diagnosed with type 2 diabetes. She is quite concerned. Her web surfing has revealed all sorts of horror stories about diabetes gone wrong. The doctor has told her that she needs to make many lifestyles changes, but they are much more easily said than done.

Jill wants to quickly get her situation under control. She would like life to go on as normally as possible, and to continue to enjoy the things that really matter to her.

Jill does not regularly exercise, and while she is somewhat aware of the diet choices she should be making, she has rarely attempted to maintain a strict discipline over what she eats.

Jill has sufficient comfort with and knowledge of computers to use email and browse the web, but this is the full extent of her interest in learning about computers. She relies on family, friends, or the local Geek Squad to resolve technical issues.

7.0 USER SCENARIOS

There are a few possibilities for user scenarios to target: any decision-making event that can impact the user's health are good targets.

I am choosing to target the daily monitoring and planning event.

Here the user adjusts their pre-established plan for meal menus, exercise, and daily insulin booster dose. It is adjusted for their actual plans for the day that may include specific exercise activities, a lunch out with friends, or compensating for high or low blood-glucose levels.

This is a decision-making event that begins when the user takes a blood-glucose reading using their device. This data is an input to their decision about what food to consume, and may be relevant to a meal that they are about to eat. For instance: will they have desert? Should they abstain from the potato?

If they are having this meal with friends, they may have to explain their decision.

In the case that they are planning to exercise after the meal, this information will directly impact their assessment of the blood-glucose information and what they should eat.

Note that this activity may occur more than once in a day.

8.0 TASK ANALYSIS

Maintain blood-glucose equilibrium:

- obtain required information for decision-making
  - assess current blood-glucose
    - measure blood glucose using device
  - assess planned activities for the day
  - assess any other pertinent state of health that could affect blood-glucose
- make decisions about adjusting the daily regimen
  - adjust food consumption plans
  - adjust activity plans for the day
  - adjust dose of insulin booster
- implement the day's regimen
  - eat according to plan
  - exercise according to plan
  - administer dose of insulin booster according to plan
- review the results
  - (possibly same day) measure blood glucose levels again
  - (next day) measure blood glucose levels
  - review actual food eaten
  - review actual exercise performed
  - review actual state of health