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eTherapy- Evaluation

Master Digital Healthcare

Christian Waldschütz dh171811
Elise Mandl dh171830
Georg Hofstätter dh171827

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1 Introduction

1.1 Background

Nutrition, and particularly malnutrition, is a key concern in cancer management, with estimates of between 20-70% of cancer patients worldwide being malnourished and up to 10-20% of cancer deaths estimated to be due to malnutrition [1].
Nutrition intervention during cancer treatment may reduce postoperative infection rates, result in better control of cancer-related symptoms, reduce length of stay in hospital, improve tolerance to treatment and improve overall quality of life [1]–[4].
However, with regards to nutrition, cancer patients often suffer from fragmented continuation of care and long breaks between on-site consults with health professionals. This puts them at increased risk of malnutrition.

Remote monitoring of patients is one method that could decrease malnutrition risk. However, there is a lack of clinically relevant and validated technical support for dietitians seeking to monitor patient's clinical nutrition status outside of hospital. A possible solution, eTherapy, has been developed as a prototype remote monitoring solution designed to support dietitians and cancer patients during, between and after cancer therapy.

1.2 Solution Description

A responsive website was developed using PHP, JavaScript and a SQL database. The website enables cancer patients to record key nutrition data and share it with a nutrition professional. The solution consists of two parts:

1. A patient-oriented portal where patients can enter key nutrition data such as weight, symptoms, appetite and activity (Figure 1).
2. A professional oriented portal where dietitians can track the patients progress and respond to deteriorations in the patient's status (Figure 2).

Both these components are accessed over a central online portal at www.etherapy.at.

Figures 1 and 2 show screenshots of the prototype interface.

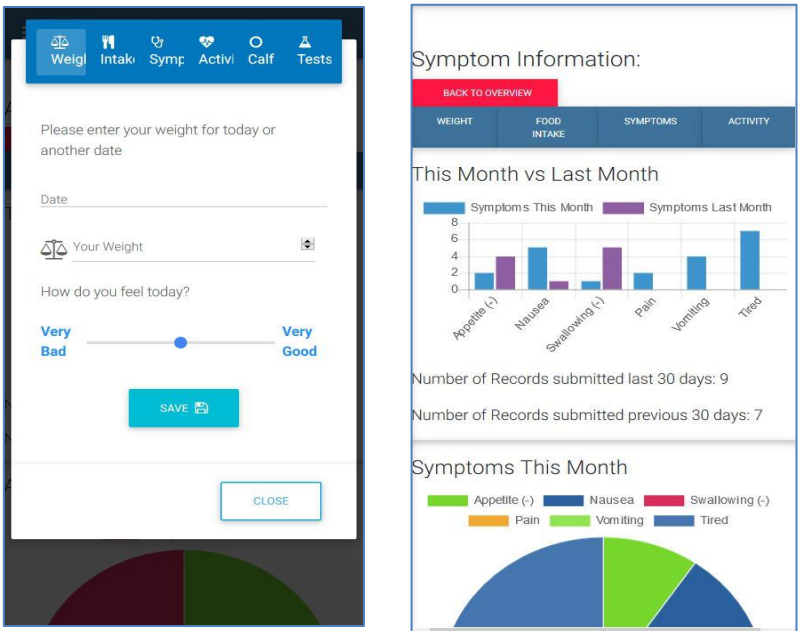

Figure 1: Selected views of Patient portal in eTherapy

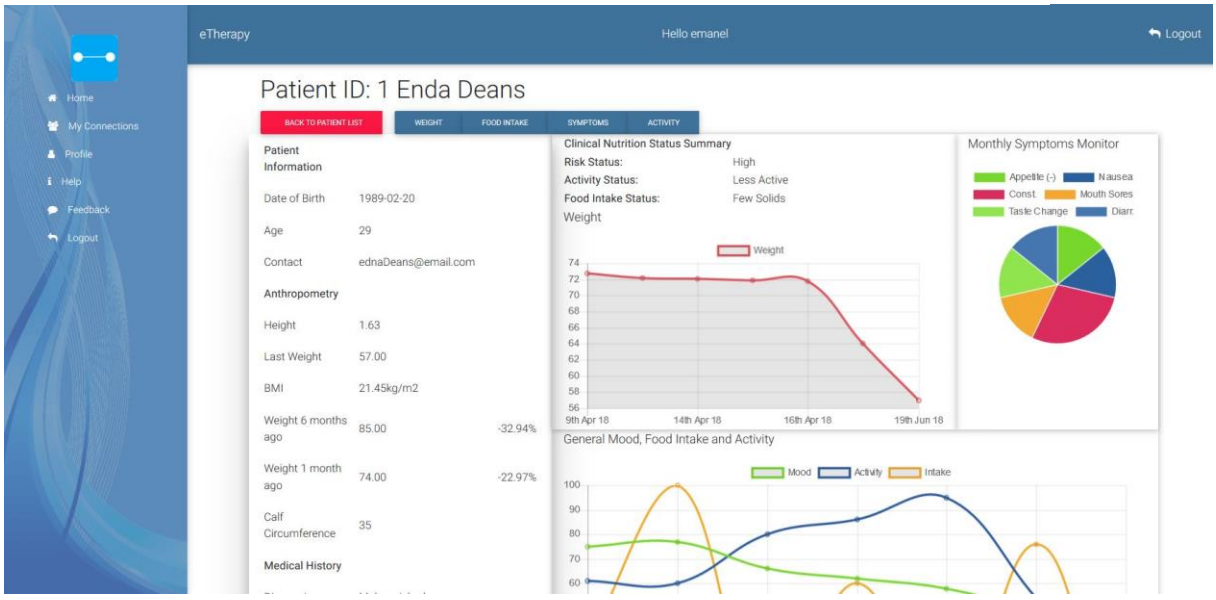

Figure 2: Selected View of Professional portal in eTherapy

The patient questionnaire is primarily based on part 1 of the validated nutrition assessment form “Patient Generated Subjective Global Assessment” also known as the PG-SGA (Figure 3)[5].

Scored Patient-Generated Subjective Global Assessment (PG-SGA)

History: Boxes 1 - 4 are designed to be completed by the patient.
[Boxes 1-4 are referred to as the PG-SGA Short Form (SF)]

Patient Identification Information

1. Weight *(See Worksheet 1)*

In summary of my current and recent weight:

I currently weigh about _____kg
I am about _____ cm tall

One month ago I weighed about _____ kg
Six months ago I weighed about _____ kg

During the past two weeks my weight has:
☐ decreased (1) ☐ not changed (0) ☐ increased (0)

Box 1 ☐

2. Food intake: As compared to my normal intake, I would rate my food intake during the past month as

☐ unchanged (0)
☐ more than usual (0)
☐ less than usual (1)

I am now taking
☐ *normal food* but less than normal amount (1)
☐ little solid food (2)
☐ only liquids (3)
☐ only nutritional supplements (3)
☐ very little of anything (4)
☐ only tube feedings or only nutrition by vein (0) **Box 2** ☐

3. Symptoms: I have had the following problems that have kept me from eating enough during the past two weeks (check all that apply)

☐ no problems eating (0)
☐ no appetite, just did not feel like eating (3)
☐ nausea (1)
☐ constipation (1)
☐ mouth sores (2)
☐ things taste funny or have no taste (1)
☐ problems swallowing (2)
☐ vomiting (3)
☐ diarrhea (3)
☐ dry mouth (1)
☐ smells bother me (1)
☐ feel full quickly (1)
☐ fatigue (1)
☐ pain; where? (3) _____
☐ other (1)** _____
Examples: depression, money, or dental problems **Box 3 ☐

4. Activities and Function:
Over the past month, I would generally rate my activity as:

☐ normal with no limitations (0)
☐ not my normal self, but able to be up and about with fairly normal activities (1)
☐ not feeling up to most things, but in bed or chair less than half the day (2)
☐ able to do little activity and spend most of the day in bed or chair (3)
☐ pretty much bed ridden, rarely out of bed (3)

Box 4 ☐

The remainder of this form is to be completed by your doctor, nurse, dietitian, or therapist. Thank you.

Additive Score of Boxes 1-4 ☐ **A**

email: faithotterymdphd@aol.com or info@pt-global.org

Figure 3: Scored Patient-Generated Subjective Global Assessment

2 Usability and User Experience Evaluation

2.1 Introduction

There are many aspects to be taken into consideration when evaluating a product, application or service including functionality, utility, usability, user experience, cost and acceptability [6]. There are various methods and techniques to assess these different aspects, but all are important when evaluating a product in the context of holistic user-centred design.
Functionality has been preliminarily assessed during the development phase of the eTherapy prototype and utility assessments (e.g. clinical testing) is beyond the scope of the project, thus the following evaluation focuses on usability and user experience. Chapter 3 offers analysis and insight into some aspects of cost, including funding and financing concerns.

Usability

Usability has been defined in the International Organisation for Standardisation (ISO) standard 9241 as:
"*the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use"* [7].
The aim of usability testing is to assess how well an application or product functions and whether it serves its intended purpose. It typically is measured across domains such as flexibility, operability, understandability, learnability, efficiency, satisfaction, attractiveness, consistency and error rates [8]. Methods to measure usability include expert evaluation (e.g. heuristic evaluation), observation (e.g. cognitive walkthrough), surveys and experiments. The tests may be carried out in a laboratory setting which has the advantage of higher level of control and smaller numbers of participants. They could also be implemented as field tests, which allows observation of real-world usage of the product, however can be more difficult to control [8].

User Experience

A related but different concept is user experience. The ISO 9241 defines user experience as:
"*user's perception and responses that result from the use and/or anticipated use of a system, product or service"* [7].
In comparison to usability which focuses on goals and satisfaction, user experience focuses more on perceptions, emotions, beliefs and preferences. A user's experience may be affected by the usability of a product, but may also be influenced by other aspects, some of which may be beyond the scope of user-centred design. While there are many well specified methods for testing usability, user experience evaluation seems to be interpreted more broadly as

optimising the whole user experience through user centred design methods [9]. Methods include user opinion/interview (focus groups, interview, contextual enquiry), user questionnaires (UEQ, Magnitude estimation, TRUE), human responses (psycho-physiological measurements) and expert evaluation [9].

In the following evaluation, the chosen tool is the User Experience Questionnaire developed by Laugwitz, Schrepp and Held [10]. The questionnaire measures aspects of both usability and user experience, developed from a theoretical framework based on hedonic quality, ergonomic quality and perceived attractiveness [10].

2.2 Methods

An evaluation of eTherapy was conducted using the "User Experience Questionnaire" (UEQ)[10] in the course of a simulated case-study developed in cooperation with 3rd and 5th semester dietetics students at the St. Pölten University of Applied Science in December 2018.

2.2.1 Case Study

A case study was conducted with 3rd semester dietetic students playing the role of the patient, and 5th semester students playing the role of the dietitian. Both groups of students were given an introduction and short tutorial to the eTherapy system and interface. Additionally, three patient- and three professional profiles were developed, and user accounts set up for the students prior to starting the scenarios.
Six students from the 3rd semester of the program developed 3 hypothetical patient cases relating to oncological nutritional problems. They then simulated these cases by using the eTherapy program over a week and recording data daily for the patient's weight, appetite, activity and symptoms.
Following this week, the class of the 5th semester students logged in to the professional side of eTherapy and reviewed the given patient cases, simulating a dietitian. They then provided feedback to the 3rd semester students based on the given information, such as suggestions to improve appetite or mitigate symptoms.
Following this, the 3rd semester students completed another week of data entry in reaction to these instructions. Finally, the 5th semester students again logged into the professional side and reviewed the results of their initial advice.

2.2.2 UEQ Questionnaire

After completing the simulated case study, students were asked to fill out the "User Experience Questionnaire" (UEQ) online [10]. A copy of the questionnaire can be found in the Appendix. The UEQ was originally a German language questionnaire created by Laugwitz, Schrepp and

Held in 2005. The questionnaire measures 6 scales of user experience across 3 dimensions (Figure 4).

The 3 dimensions and their scales are:

- Valence: Attractiveness
- Pragmatic Quality: Perspicuity (clarity), Efficiency, Dependability
- Hedonic: Stimulation, Novelty

All together there are 26 items that are scaled from -3 to +3, with -3 representing the most negative answer and +3 the most positive, 0 is neutral.
Descriptive statistics were generated by use of the UEQ Data Analysis Tool. In the absence of comparison data the UEQ results are compared to benchmarks provided by the UEQ developers [11]. Guttmans Lambda2 was used to assess internal consistency of answers.

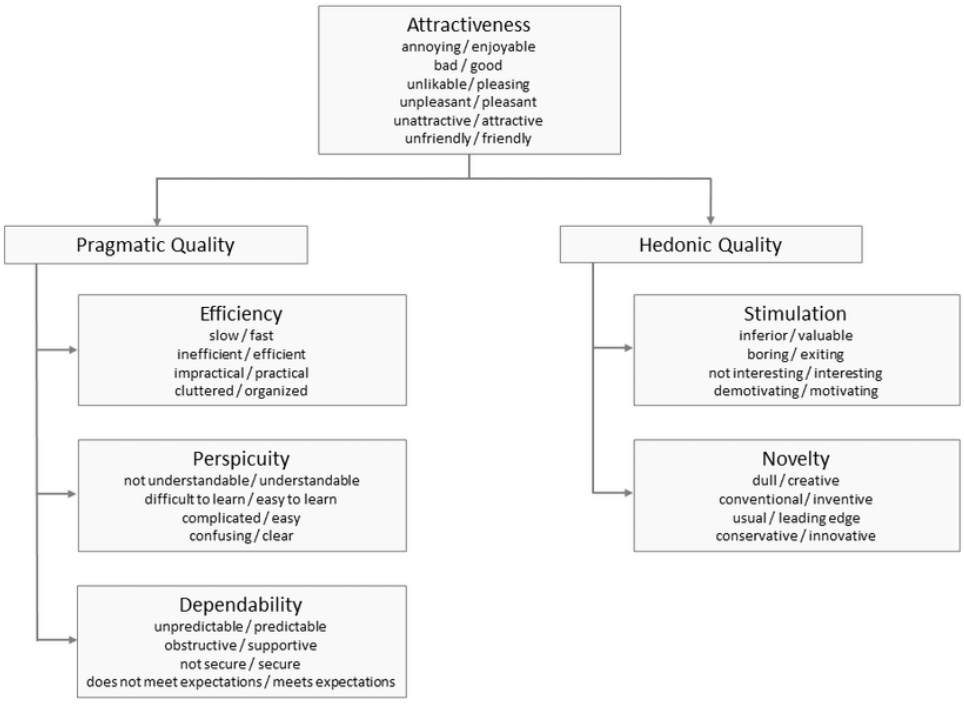

Figure 4: Scale Structure of UEQ (Schrepp 2018) [12]

2.2.3 Qualitative Experience

The eTherapy developers also recorded subjective responses, difficulties and questions from the students as well as their own experience through the procedure. This subjective feedback was recorded and summarised.

2.3 Results

2.3.1 UEQ Questionnaire

Five out of six students (83%) from the 3rd semester student group completed the user experience questionnaire. No students from the 5th semester group completed the questionnaire.

The overall results were primarily positive. Values between -0.8 and 0.8 represent a more or less neutral evaluation of the corresponding scale, values > 0,8 represent a positive evaluation and values < -0,8 represent a negative evaluation. Of the 26 items measured, 23 scored positivley (89%), 2 scored neutral (7.7%) and 1 scored negativley (3.8%) (Figure 5)

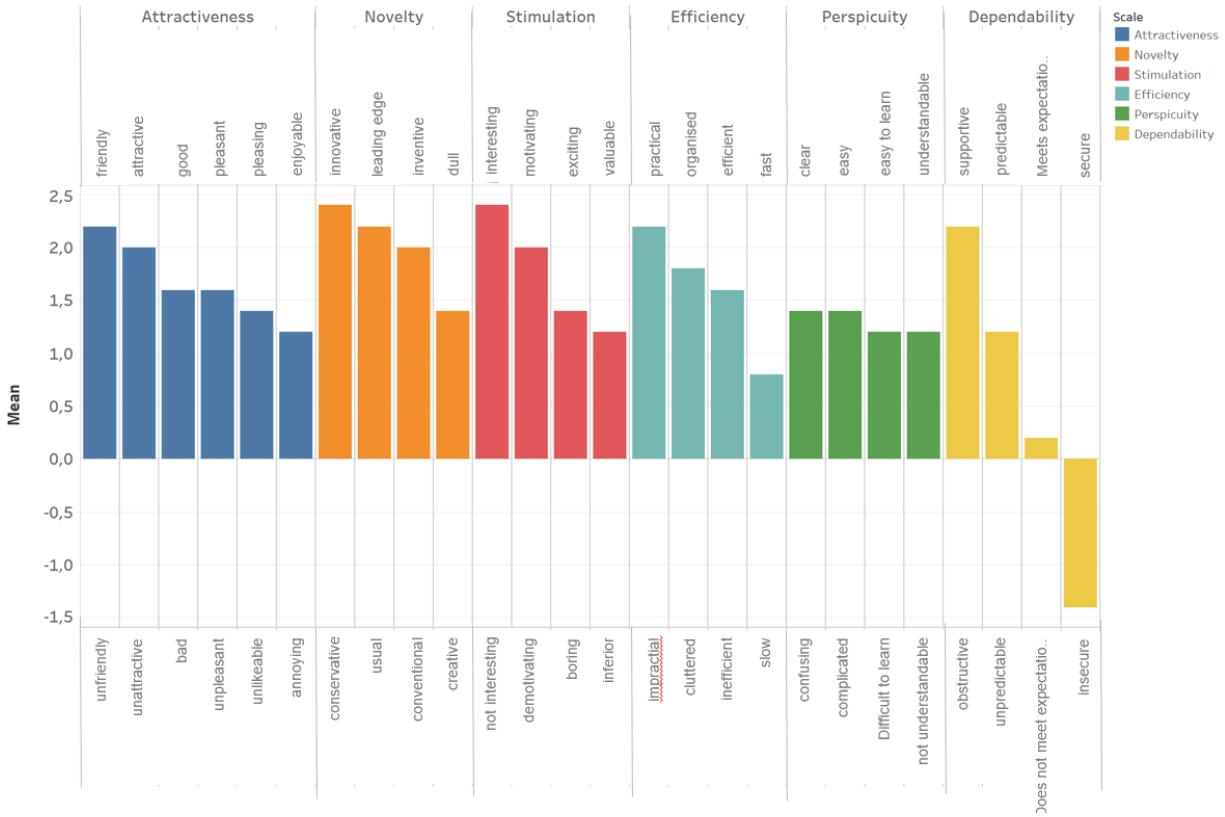

Figure 5: UEQ Mean Response Values

The questions that scored the best were spread across several scales: efficiency (practical), novelty (leading edge, innovative), dependability (supportive), attractiveness (attractive), and stimulation (interesting). The question that scored the worst occurred in the scale of dependability (not secure). Figure 6 shows the variance of answers between participants. The values for meets expectations/does not meet expectations and valuable/not valuable show a higher degree of variance indicating potentially significant disagreement between

participants, though further testing of agreement/disagreement were not conducted given the small sample size.

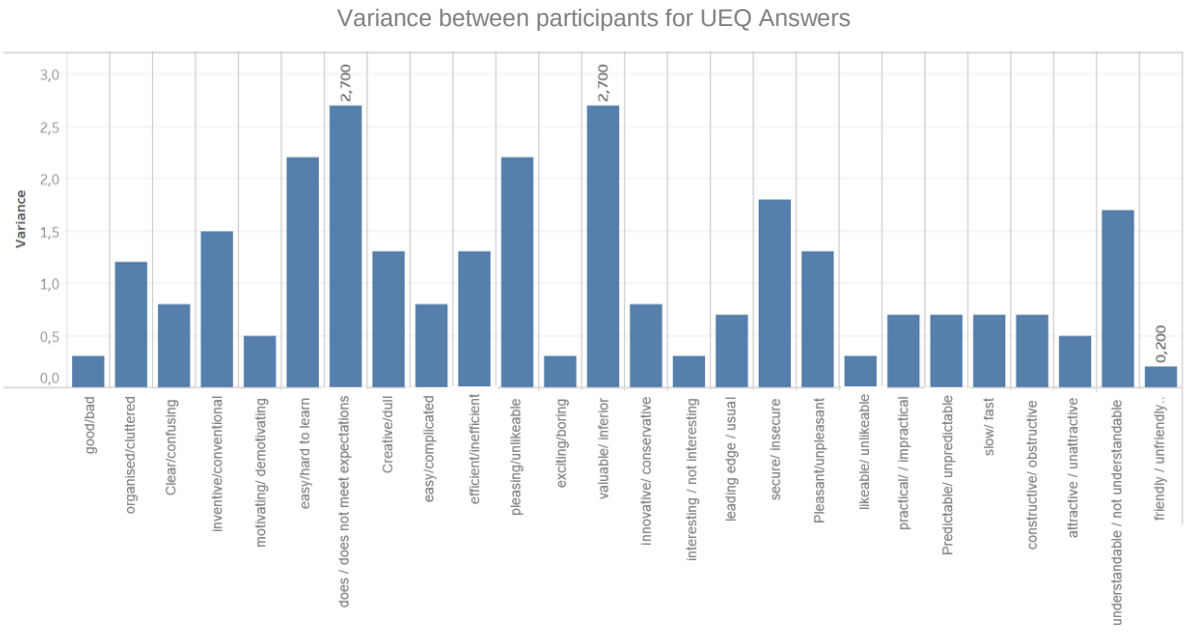

Figure 6: Variance in participant answers of UEQ

Figures 7 and 8 highlight the results of the UEQ grouped by domain and scale. In the domains, hedonic quality scored best (mean=1.88) followed by attractiveness (mean=1.67) and pragmatic quality (mean=1.15). For the scales, novelty performed the best (mean=2, SD=0.7, CI=1.4-2.6), followed by stimulation (mean= 1.75, SD=0.8, CI=1.1-2.4), attractiveness (mean = 1.67, SD=0.7, CI=1.1-2.3), efficiency (mean=1.6, SD=0.6, CI=1.1-2.1), perspicuity (mean=1.3, SD=0.8, CI=0.6-2.0), and finally dependability (mean=0.55, SD=0.6, CI=0-1.1). The standard error bars for scale are quite large particularly for perspicuity and dependability.

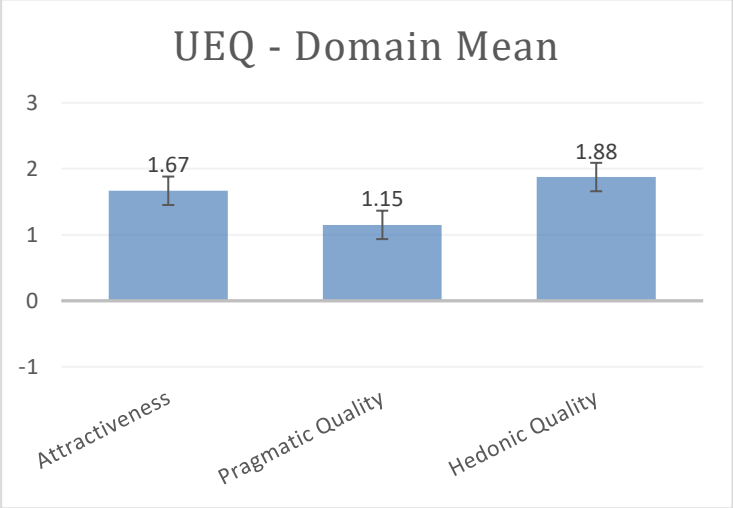

Figure 7: UEQ- Domain Mean with standard error bars

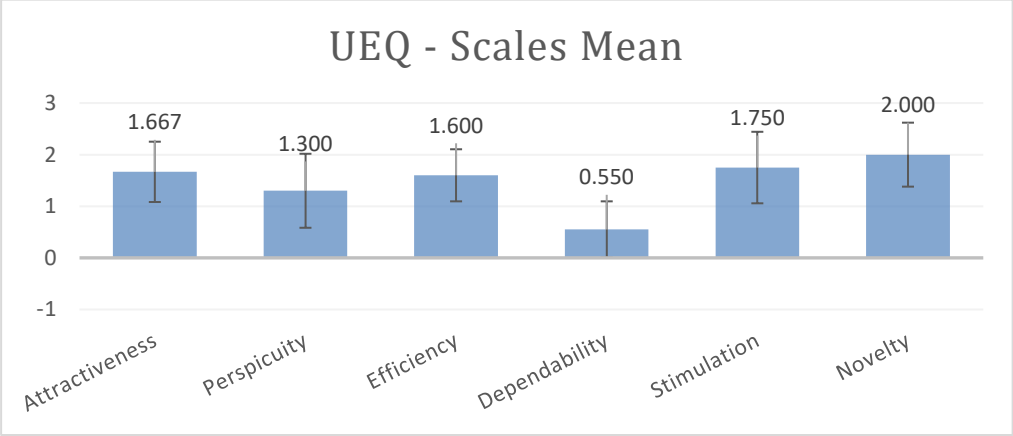

Figure 8: UEQ- Scales Mean with standard error bars

Benchmarking

The UEQ tool provides benchmarks for evaluating scores against an existing set of data. This data set contains data from 18483 persons from 401 studies concerning different products (business software, web pages, web shops, social networks).
The comparison of the results for the evaluated product with the data in the benchmark allows conclusions about the relative quality of the evaluated product compared to other products.
Novelty and stimulation scored in the top 10% of results, attractiveness, and efficiency scored in the top 25%, perspicuity in the top 50% and dependability scored in the bottom 25% of results (Table 1).

Table 1: Benchmark results of UEQ

Benchmark

Scale	Mean	Comparison to ..	Interpretation
Attractiveness	1,67	Good	10% of results better, 75% of results worse
Dependability	0,55	Bad	In the range of the 25% worst results
Efficiency	1,60	Good	10% of results better, 75% of results worse
Novelty	2,00	Excellent	In the range of the 10% best results
Perspicuity	1,30	Above Average	25% of results better, 50% of results worse
Stimulation	1,75	Excellent	In the range of the 10% best results

Reliability

Reliability of answers was estimated using Guttmans Lambda2. The estimates for attractiveness, Perspicuity, Stimulation indicate good consistency (0.86, 0.75, 0.81 respectively). However, efficiency, novelty and dependability scored poorly (0.59, 0.64, 0.50 respectively) indicating less internal consistency of answers in these scales.

2.3.2 Qualitative Experience

During the case study, the following additional questions and comments were noted:

- Is there a standardised approach for collecting weight data? Participants questioned how patients would know to correctly collect weight data.
- Entering multiple sets of data was too much work as for each measure the form had to be submitted separately (weight, appetite, activity, symptoms).
- It would be useful to have a live feedback system between the dietitian and the patient integrated into the service.
- A feature to allow upload, sharing and assessment of lab data would be beneficial
- It would be useful if the service was integrated into a health data information sharing service like ELGA.
- Data security is a large concern
- In the current Austrian system, the service would be difficult to implement in hospital as dietitians are not able to charge monitoring or follow up services to health insurer.

2.4 Discussion

The results of the evaluation were overall positive though interpretation should be cautious due to the low participation rate. It is not clear why the participant rate was so poor in the 5th semester students, but it may be hypothesised that as the study was run in combination with

a specific lecture topic, it simply was not seen as a priority to complete. In future better testing conditions should be ensured to improve participation rates.

The best scoring domain was hedonic quality which includes scales of stimulation and novelty. As this is the first prototype for remote monitoring of nutrition patients, it is not surprising that it scored high on novelty. Despite a lack of formal response from the 5th semester, in class feedback from participants was positive regarding the innovativeness of eTherapy and students seemed genuinely interested in the overall concept.

The second-best scoring component is attractiveness, which covers subjective questions like how pleasing the product is, attractive and friendly. The user interface was designed with not also functionality but aesthetic in the fore-front, despite only being a prototype. The visual design was made with bootstrap, which would be familiar to users due to its common usage and was designed to be device-responsive to meet user's current expectations of web-based applications.

Pragmatic quality scores lowest, despite primarily positive scores. The low score of security in the dependability scale is likely responsible. However, many of the items under pragmatic quality scored well such as efficiency, practicality and organisation. Generally participant feedback was that after a short space of time required to become familiar with the program, it was relatively easy to use. However, one noted criticism was that data entry became quite arduous if multiple days had to be entered at once. This is an interesting point as the program is designed for daily entry rather than multi-daily entry. The question arises if students entered multiple days at once because they saw the task as an assignment to be completed rather than a real-life simulation, and if so, is this critique valid for the behaviour of real patients? This would be interesting to explore in further testing with a patient user group.

Dependability was the scale that scored lowest within the pragmatic domain and also had the lowest level of reliability. It seems that participants scores security and meeting expectations low, while scoring predictability and support relatively highly. The issue of security is a somewhat confounding factor as students were told at the beginning of the test that as eTherapy is only in a prototype stage, no real patient data should be used due to security concerns. This may have influenced their answers but may not reflect on security for a further developed product. It would be interesting to collect further information on the cause for security concerns, was it just because eTherapy was in prototype stage or is it a broader concern about the digitisation of health data? The low score on meeting expectations may be due to the limited functionality of the application. In discussion with students it became clear that they would like a service that provided live feedback possibilities between the patient and provider, a way to upload and share laboratory results, integration with existing e-health services such as ELGA and health tracking devices such as Fitbit or digital scales.

While such additions are beyond the scope of the current phase of development, they open up interesting avenues to pursue in the future.

The results of the benchmark comparison were generally positive with 4 of the 6 scales scoring in the good or excellent categories. While this represents a useful tool for comparison, it would be more meaningful to compare results to other healthcare products and specifically remote monitoring services. For example a 2017 pilot study of the "Health buddies App" for atrial fibrillation patients utilised the UEQ during the study [13]. This study had 13 responses and scored 1.5 on perspicuity, 0.9 on novelty, stimulation and attractiveness, 0.6 on efficiency and 0.5 on dependability. To take this as a simple example, it could be said that eTherapy is a more novel, stimulating, attractive and efficient solution but performs more poorly in terms of perspicuity and has a similar score in dependability. While this is only an example of how health applications could be compared, such comparisons may provide better insight into common problems of health applications and perhaps open up ideas for novel solutions.

Finally, participants raised the issue of how eTherapy would be funded and implemented into the existing healthcare system. Concerns were raised regarding a lack of funding for follow-up services through hospital dietitians. These are valid concerns and highlight the need to look at various funding models and to include more experts in the development and implementation process. It would also be interesting to investigate systems in other countries determine if there are similar or different limitations to implementation within their public health care systems.

2.4.1 Limitations

The current study had a very low number of participants as well as large variance and poor reliability in some of the results. To improve the precision and accuracy of the test, a larger sample size of at least 10 participants would be required for a precision of 0.5 and error probability of 0.05.

While it is possible to elucidate some useful results from the user experience test, the results would be more meaningful if there was a comparison group available. With the absence of a valid competitor product, a useful comparison would be the patient side versus the professional side and future iterations of the product would benefit from comparison with past user experience scores.

A further significant problem with the evaluation was the timing of the user experience test. Due to outside factors it was not possible to have students complete the evaluations at the time of using the program. Rather, evaluations were carried out in the weeks following the scenario tests. This is against best practice recommendations by the UEQ designers as

participants will have had time to discuss the program, reflect on issues or even forget certain aspects. As the goal of the UEQ is to gather immediate impressions about the product a delay is not ideal. The time gap may have also contributed to the low-test completion rate.

One of the weaknesses of usability and user experience testing is that it provides little information on the learnability of the product and the changes in usability across time. It could be anticipated that a product may have lower usability scores at the beginning of use that improve over time as the user gets to know the system. Likewise, a user may have security concerns about a product at the beginning of use but build trust the longer they use it. In the future it may be useful to conduct before, during and post-use usability and user experience tests to gather data on changes in these measures across time.

A limiting factor of the testing scenario may also have been language. All students were German native speakers and the scenarios and usability tests were carried out in English. In future, language specific testing may be more appropriate.

2.5 Conclusion

Despite the small number of participants, the results indicate a generally positive user experience with eTherapy with the core area of concern being security. As the product is a prototype currently this is not particularly problematic. The results of the evaluation are promising and indicate that further development and testing of the eTherapy program is a feasible option.
Future development should focus on improving functionality, usability, improving security and assessing efficacy through a clinical trial. Further testing with larger user groups of working dietitians would be optimal.

3 Commercial Assessment

3.1 Introduction

Evaluation of eTherapy and feedback received from Dietitians, as well as exchange of experiences during Healthcare events indicates that there is a general need to support oncology patients, from a nutritional perspective, during their therapy. Benefits of eTherapy for patients and health care providers (HCP) has been extensively discussed in previous reports and a good case made for potential usage of the service.
Although the existing prototype already covers some basic functions to provide nutrition monitoring services to patients, further financial investment is required to develop the application to a more mature state and in particular to ensure that data privacy requirements are met (data privacy per design). Assuming that the project team would be able to raise funding for all needed developments and infrastructure required, a business case would be required.

3.2 Austrian Healthcare System

The healthcare system in Austria is highly fragmented due to specialisation and shows a low level of process standardization. Public Healthcare services are jointly funded by federation (Bund), states (Ländern), local government (Gemeinden) and social insurance systems (Sozialversicherung), regulated by law. There is compulsory public insurance for the working population and therefore a relatively small percentage of private insurance, resulting in low competition and innovation in the insurance industry. Also, political indecisiveness during the past years has held Austria back in the fields of highspeed internet coverage, digitalization and telehealth, compared with other developed countries e.g. Denmark or Sweden. Nevertheless, our investigation has indicated, that there are several examples of successful funding models of similar services like eTherapy. In the following chapter, four of these models are presented.

3.3 Funding Options

3.3.1 Prescription of eHealth Services – HerzMobil Tirol

HerzMobil Tirol service has been developed for patients with chronic heart failure disease. The solution not only provides a technical system to monitor patient's health indicators remotely but also offers full integration of the patient into the care process.
In contrast to reimbursement processes for drugs, the full path of treatment needs to demonstrate effectiveness for eHealth services. This means that it will not be sufficient to develop any service that might ensure better therapy outcome, but the full treatment process has to be validated.
For HerzMobil Tirol service following timelines until 'go live' applied:

Phase I	Feasibility study (18 months)
Phase II	Proof-of-Concept, region Tyrol (13 months)
Phase III	Design of treatment path (12 months)
Phase IV	Preparation to integrate solution into environment (12 months)
Phase V	Transition (6 months), go live 1.7.2018

Target for this program was enrolment of patients in a multidisciplinary care management program to reduce the risk of hospitalisation and mortality. Several criteria have been defined to in-/exclude patients from program. Sixhundred patients are expected to participate per year.

Facts & Funding
- Hospitals connected to the program: 4
- HCPs involved in the care process: 16.5 FTE
- Program is funded by:
    - Tiroler Gesundheitsfond (TGF)
    - Tirol Kliniken
    - Austrian Institute of Technology (AIT)
    - Social Insurance Tyrol (TGKK)
- Patients are admitted to the program for 3 months (in some cases 6 months)

3.3.2 Service funded by private Health Insurance / Employer

A current problem of the public healthcare approach in Austria is the missing focus on health prevention and health protection. The first public insurance company that motivated their members to proactively participate in health protection programs was SVA. SVA members are self-employed workers, paying retention for any medical treatment received. The

insurance company offered a bisection of retention if members participated in a regular preventive program, monitored by a general practitioner.
Private insurance companies meanwhile have entered the market and offer various services in the area of health prevention. Benefits in most cases combine life and private health insurance with health care prevention programs. The most advanced provider in the Austrian insurance market is UNIQA.
UNIQA has created ‚VitalCoach', which offers a wide range of health prevention services. Starting from online content explaining how to stay healthy or have a better life, up to a modular system of support and insurance services, including a personal coach to accomplish private targets (i.e. weight loss, better manage a chronical disease, work on mental health).
eTherapy team attended an event at Vienna's Start-up centre weXelerate in October 2018. Healthcare start-ups were pitching for funding of their ideas or final products, the event was supported by UNIQA Ventures, MedUni Wien, Pfizer, Diagnosia and Speedinvest. We could observe strong interest of investors in new healthcare services in general. Some of the presented solutions are either already under the umbrella of UNIQA Ventures or clearly held the attention of the public audience.
We see a high potential of eTherapy acquiring funding by private insurance companies, if focus is put on presenting a generic nutrition monitoring process solution that could be applied across a range of patients and services.

3.3.3 Service funded by Dietitians, general practitioners and patients

Feedback from dietitians and students during evaluation project, health care professionals and patients resulted in the hope that funding of eTherapy by users themselves is possible too.
Options for realisation:
1. Dietitians recommend eTherapy service to oncology patients when they leave hospital and stay connected with the patients. As many Dietitians work part time, this would allow monitoring and support until follow up visit and potentially create a private customer base, depending on employment conditions. Dietitians would have to pay a monthly fee for being registered in the service, patients would just pay a small fee for downloading the App.
2. General practitioners recommend eTherapy service to patients at first diagnosis or follow up of oncological disease. It would also be possible for doctors to refer patients with specific nutrition requirements to dietitians or a registered nutritionist if guidance by professionals could improve or stabilise health state. This model would allow doctors with limited nutrition experience to access a pool of experts. The funding approach could be similar to that outlined in number 1.

3.3.4 Free service with alternative funding route

Besides any combination of options described previously, eTherapy service could be offered for free to all participants (HCPs and patients). Funding then would be obtained by selling data generated within the service and targeted advertisements (i.e. nutrition companies might be interested in selling their products directly to dietitians).

A similar approach has been chosen by ‚Diagnosia', a company offering drug information to doctors and hospitals for free. The service provides multiple information about drugs, indication, side effects, dosage, price and more to the experts using it. The business model is based on two main components:

- data analysis and usage reports provided to i.e. pharmaceutical companies and
- small questionnaires embedded in the service. High user response rates due to high quality of service, allow to conduct small surveys and deliver results to customers nearly in real-time.

Potential problems with this model include acceptance by users of data transfer and potential legal issues with data transfer.

3.4 Conclusion

There is high potential and need for a remote monitoring solution in the market and we are convinced, that funding for such a service is quite realistic. However, we have learned, that to be successful, we need to focus on a healthcare nutrition process supported by eTherapy, instead of only offering a technical solution for remote monitoring.

4 Outlook and Conclusions

eTherapy has come a significant way over the course of just over one year of development, testing and evaluation. Significant milestones of the project include:

- Development of a strong theoretical base through a detailed literature review
- Prototyping of the Product
- Evaluation of user experience and
- Evaluation of funding options

All components have been largely successful and response from users has been positive.

Looking to the future there are some core areas of development that should be worked on before the next phase of testing:

- Increasing of security features
- Integration of wearable devices
- Integration of a live chat or feedback service
- Integration of lab results and reports

Further testing phases should involve more robust usability tests and user experience tests with larger participant numbers drawn from intended user group. Additionally, if the product is to be used in a clinical setting clinical testing will be necessary and additional certification required. This would need to be done in cooperation with multidisciplinary experts and would require at least an extra 2 years of testing.

There are possible funding and implementation models outside of the clinical setting, including private practice dietitians and doctors. These models as well as others deserve careful investigation before embarking on a costly and complex clinical trial.

Overall the feedback from test participants, colleagues and experts indicates there *is* a need for a solution like eTherapy not just in cancer patients but in a broader scope of healthcare monitoring. There is an enthusiasm and interest in the community, so it is essential that eTherapy continues to develop in line with user expectations and that users remain a key determining stakeholder in any future developments.

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6 Appendix

User Experience Questionnaire

Please make your evaluation now.

For the assessment of the product, please fill out the following questionnaire. The questionnaire consists of pairs of contrasting attributes that may apply to the product. The circles between the attributes represent gradations between the opposites. You can express your agreement with the attributes by ticking the circle that most closely reflects your impression.

Example:

attractive	○	⊗	○	○	○	○	○ unattractive

This response would mean that you rate the application as more attractive than unattractive.

Please decide spontaneously. Don't think too long about your decision to make sure that you convey your original impression.

Sometimes you may not be completely sure about your agreement with a particular attribute or you may find that the attribute does not apply completely to the particular product. Nevertheless, please tick a circle in every line.

It is your personal opinion that counts. Please remember: there is no wrong or right answer!

Please assess the product now by ticking one circle per line.

	1	2	3	4	5	6	7		
annoying	○	○	○	○	○	○	○	enjoyable	1
not understandable	○	○	○	○	○	○	○	understandable	2
creative	○	○	○	○	○	○	○	dull	3
easy to learn	○	○	○	○	○	○	○	difficult to learn	4
valuable	○	○	○	○	○	○	○	inferior	5
boring	○	○	○	○	○	○	○	exciting	6
not interesting	○	○	○	○	○	○	○	interesting	7
unpredictable	○	○	○	○	○	○	○	predictable	8
fast	○	○	○	○	○	○	○	slow	9
inventive	○	○	○	○	○	○	○	conventional	10
obstructive	○	○	○	○	○	○	○	supportive	11
good	○	○	○	○	○	○	○	bad	12
complicated	○	○	○	○	○	○	○	easy	13
unlikable	○	○	○	○	○	○	○	pleasing	14
usual	○	○	○	○	○	○	○	leading edge	15
unpleasant	○	○	○	○	○	○	○	pleasant	16
secure	○	○	○	○	○	○	○	not secure	17
motivating	○	○	○	○	○	○	○	demotivating	18
meets expectations	○	○	○	○	○	○	○	does not meet expectations	19
inefficient	○	○	○	○	○	○	○	efficient	20
clear	○	○	○	○	○	○	○	confusing	21
impractical	○	○	○	○	○	○	○	practical	22
organized	○	○	○	○	○	○	○	cluttered	23
attractive	○	○	○	○	○	○	○	unattractive	24
friendly	○	○	○	○	○	○	○	unfriendly	25
conservative	○	○	○	○	○	○	○	innovative	26