

Webtool design factors and evaluation within a youth healthcare setting

Mentors

Prof. Robert A. Stegwee (Primary mentor)
Dr. Magda M. Boere-Boonekamp (Secondary mentor)
Dr. Elise M.L. Dusseldorp (TNO mentor)

Student

Ewoud L. van Helden, BSc
University Twente
Master: Industrial Engineering and Management
Track: Healthcare Technology and Management

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Summary

There is a continuous need for improvement within healthcare caused by numerous factors and it is generally accepted that information technology (IT) plays an important role in these improvements. The Quality of Life Department of the Dutch Organization for Applied-Scientific Research (TNO) was doing research on several topics to improve healthcare. One of their projects focused on the screening of children for development disorder within youth healthcare. The use of the screening would be done via a webtool, a website which required data about the child and returned the risk of developmental disorder. Such a webtool needed to be developed.

This study consists of two research phases. Research Phase I searched for factors impacting the usefulness and ease of use of the webtool. Perceived usefulness and perceived ease of use are two variables from the Technology Acceptance Model [Davis 1989] which contribute to actual use of IT. Determining which factors would have impact on these two variables would help the development of the webtool. Through the use Multidimensional Unfolding the preferences of the youth healthcare physicians (YHP) was made clear. Three factors were studied, namely Functionality, Interface and Autonomy. From these three was Autonomy the most important factor. The YHPs required freedom and overview to work effectively. Extra functionality and a well designed interface also contributed to the usefulness of the webtool. These findings were implemented in the final webtool.

In Research Phase II the YHPs from the TNO project were evaluated after the project was completed. The evaluation was based on the process of the YHP and the objects of the webtool. The webtool was easy to use. However the extra functionality from phase I was not used. This inconsistency shows the importance of evaluation and continuous improvement of IT after the implementation.

The webtool and screening did not offer the intended usefulness in helping the YHPs assess the development better. They did not feel the webtool led to different decisions or more referrals. Most of the times the development was normal and the webtool confirmed this, adding no new insights. On the rare occasion the webtool did give a different assessment, the YHP deemed the webtool being wrong and rejected the outcome. This could have been caused by the YHPs misunderstanding the significance and meaning of the screening. However the visual aspects of the webtool assisted in the communication towards the parents. The outcome of the screening could help convince the parent to take action or comfort the parent that the development was going well. Working with the webtool also made the YHPs more conscious of their own work and decision process.

The importance of the three factors and the evaluation outcomes are useful for further webtool development and digital projects within youth healthcare. YHPs require operational freedom but IT could help them to make decisions more conscious. The communication towards the parents can also be improved by visualizing test outcomes. But it remains important that the user understands the outcome of the IT before it can be truly useful.

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Index

Introduction	6
1 <i>Introduction</i>	6
1.1 Background	6
1.2 Objective	7
1.3 Research question	7
1.4 Relevance	9
1.5 Study context	9
1.6 Research Approach	10
1.7 Structure	12
Pre Research	14
2 <i>Physicians working process</i>	14
3 <i>Physicians and IT</i>	18
4 <i>Description of the webtool</i>	19
Research Phase I: Webtool design factors.....	21
5 <i>Introduction of Research Phase I.....</i>	21
6 <i>Literature search I.....</i>	22
7 <i>Determining three independent factors.....</i>	23
7.1 Functionality.....	24
7.2 Interface.....	24
7.3 Autonomy.....	25
8 <i>Operationalization of the factors.....</i>	26
8.1 Method of analysis	26
8.2 Functionality	27
8.3 Interface.....	28
8.4 Autonomy	29
8.5 Usefulness	29
8.6 Ease of Use	30
9 <i>Interview setup I.....</i>	31
9.1 Method	31
9.2 Pilot Interview	31
9.3 Sample	32
10 <i>Observations</i>	33
11 <i>Analysis.....</i>	35
11.1 Quantitative Analysis	35
11.1.1 Analysis for Usefulness	35
11.1.2 Statistical analysis Ease of Use	39
11.2 Qualitative analysis	42
12 <i>Conclusions of Research Phase I</i>	44
13 <i>Recommendations of Research Phase I</i>	46
Research Phase II: Webtool evaluation.....	48
14 <i>Introduction Research Phase II.....</i>	48
15 <i>Literature search II.....</i>	49
16 <i>Evaluation operationalization.....</i>	51
16.1 Process perspective	51
16.2 Webtool perspective	52

16.3 Other questions	53
17 Interview setup II.....	55
17.1 Method	55
17.2 Pilot Interview	55
17.3 Sample.....	55
18 Observations and analysis	56
18.1 Process perspective evaluation.....	56
18.2 Webtool perspective evaluation.....	59
18.3 Usefulness, Ease of Use and future use	60
Post Research.....	65
20 Discussion.....	65
20.1 Limitations.....	65
20.2 Unintended findings.....	67
21 Final Conclusions.....	69
References.....	71
Appendix.....	76
Appendix A: Generation and selection of Multidimensional Unfolding solutions	77
Appendix B: Explanation of Multidimensional Unfolding analysis methods.....	80
Appendix C: Scenario material.....	82
Appendix D: Interview I text.....	.95
Appendix E: Interview I form.....	.97
Appendix F: Interview I response.....	.98
Appendix G: Application recommendations I.....	109
Appendix H: Results literature search for factors.....	114
Appendix I: Interview II text and form.....	117
Appendix J: Interview II response.....	124

1 Introduction

1.1 Background

There is a continuous need for improvement within healthcare caused by numerous factors, like the aging population, complexity of diseases and healthcare delivered or increased costs. It is generally accepted that information technology (IT) plays an important role in these improvements. The healthcare sector was lagging in the application of IT, but is making big steps recently. But the implementation of IT proves difficult in any industry, perhaps even more so in healthcare. The implementation of IT and the adoption afterwards have therefore been a subject of great study [Spil 2009].

The Quality of Life Department of the Dutch Organization for Applied-Scientific Research (TNO) was doing research on several topics to improve healthcare. One of their projects focused on the screening of children for development disorder. They have developed a screening which uses an algorithm to predict the risk of a child ending in special education, the Developmental-screening (*D*-screening) [Boere-Boonekamp 2009]. Youth healthcare physicians (YHPs) from the region of Gouda employed by GGD Hollands Midden agreed to help TNO test this screening in practise. They had to test whether the screening gives reliable outcomes and if such a screening was useful. The use of the screening would be done via a webtool, a website which required data about the child and returned the risk of developmental disorder. Such a webtool needed to be developed.

A good webtool delivers some functionality which is useful and takes little effort to operate. The well established Technology Acceptance Model (TAM) [Davis 1989] predicts that both the usefulness and ease of use perceived by the user will predict actual use. This means that an easy and useful webtool will be adopted better than one which is not. The question remains what makes a webtool easy. Or what makes a webtool useful in the eyes of the YHP. Scientific literature about antecedents of these two factors is less common than TAM. The application of this knowledge to webtools and physicians is even less common. Understanding of factors which impact ease of use and usefulness of a webtool would enable better development of webtools, which in turns would be adopted better.

Building the perfect webtool, even based on the perceived usefulness of the YHPs offers little improvement if it doesn't fit well into the process of user. Well designed IT is only one ingredient of the improvement. A successful improvement is also dependent on ability of the user to use that IT for a better performance. IT is often build to perform a certain function, but it is also important to see how this function affects the process it is supposed to support. To be more concrete, it is important to build a good webtool which allows the use of the *D*-screening (i.e. a certain function). But this webtool with *D*-screening needs to add something relevant for the YHP and its process (i.e. does it support). The focus needs to be on the user and their working process.

The need for good IT to facilitate improvements in healthcare becomes very concrete in the development of a webtool which supports the use of the *D*-screening, developed by TNO. This study addresses the development of the webtool based on factors influencing usefulness and ease of use. Already there is a large body of research on this topic. This study hopes to delve deeper into influential factors and apply it on webtools. An ideal webtool should be the result once the optimum factor values are determined.

This study also focuses on the user and their experience by looking at the fit within the process of the YHP. An evaluation of the fit of the webtool will show if it would be an actual improvement for the user.

1.2 Objective

The purpose of this study is twofold. The first goal is to gain a better understanding of factors influencing IT use, in order to design good webtools. Finding factors which influence usefulness and ease of use and how they affect them, enables the design of better webtools. However a good product does not guarantee good adoption. It is also important to research the fit of the webtool within the process. This is the second goal. Only if the product delivers value while not taking too much effort, time or other resources within the process and tasks of the user will it be worthwhile. The fit of the webtool, how much value it delivers and how easy it is to use will be evaluated. This will reveal any shortcomings in the design of the webtool.

Within the large domain of IT this study will focus on webtools. Webtools are applications based on a website, usually resulting in small and relatively simple systems. Using the system can often be done with very few frames/screens. In case of the *D*-screening all functionality is delivered in one page.

Healthcare is narrowed down to youth healthcare, because the study takes place within youth healthcare. Though results may be generalizable to other sectors of healthcare or even general users, YHPs have different tasks than other healthcare professionals (for example broad observation instead of specialist care) and other characteristics which can result in different priorities for using a webtool.

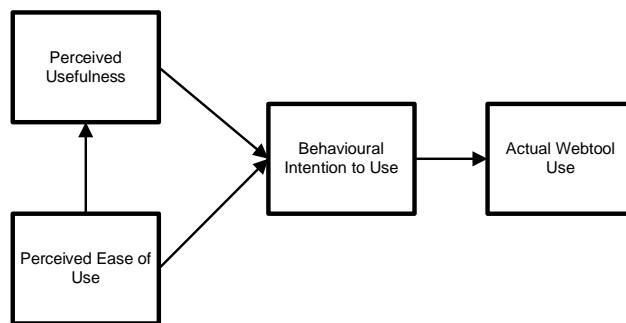
1.3 Research question

Following the two goals, two research questions emerge. The first research question is:

1) Which factors impact the Usefulness and Ease of Use of webtools for youth healthcare physicians?

The term “factors” is broad. In this research a factor is an aspect of the webtool which contributes to Usefulness or Ease of Use. This research is looking for attributes of webtools, but is looking wider than specifications or just technical factors. The factors are design attributes about the content of the webtool and the means of delivery. Any factors outside the webtool itself, for example culture or environment, are excluded for study because of limited resources. Though they could have a great impact on adoption and use, they are not researched in this study.

“Usefulness” and “Ease of use” are two items derived from the Technology Acceptance Model (TAM) [Davis 1989]. The model in its earliest form contained only two independent variables: perceived usefulness and perceived ease of use. These two determined the behavioural intention to use a system, which determined actual use.



TAM defines Perceived Usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance.”

Perceived Ease of Use is defined as “the degree to which a person believes that using a particular system would be free of effort.”

The model has been tested and applied numerous times. Many extensions have been made, hoping to add to the explaining power of the model. Examples are task-technology fit [Dishaw and Strong 1998][Mathieson and Keil 1998], self-efficacy [Dishaw, Strong and Bandy 2002] and the Unified Theory of Acceptance and Use of Technology [Venkatesh 2003] joining TAM and other theories with the constructs social influence and facilitating conditions. The TAM is still a very dominant model within IT adoption literature [Spil 2009]. However, to keep our model parsimonious and because most literature agrees on these two concepts the research question contains only perceived usefulness and perceived ease of use in the form of Usefulness and Ease of Use as dependent variables.

The research model is visualized in figure 1.

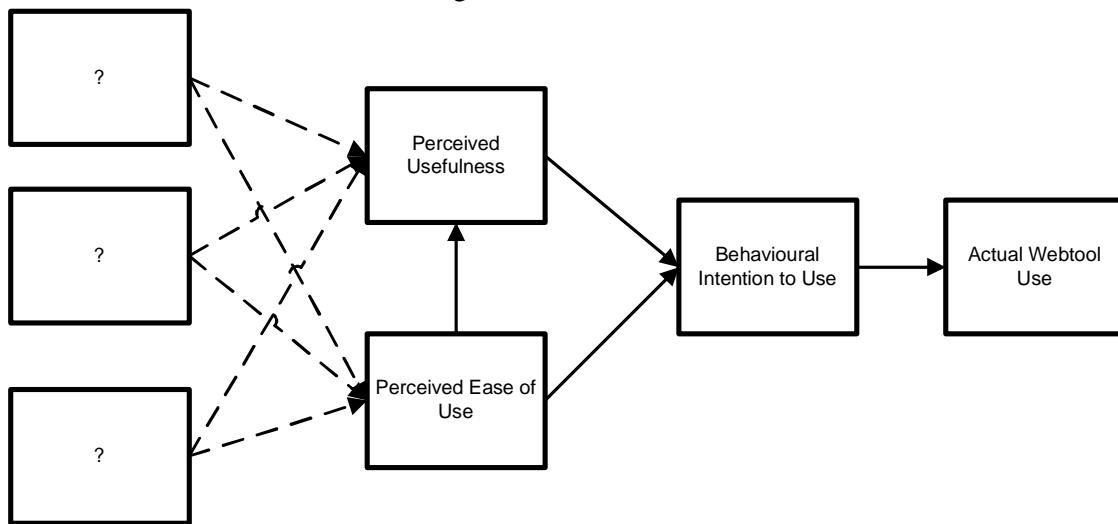


Figure 1: Research Model

This research question results in several sub research questions. In the process of answering the research question several questions appeared. What are possible factors. As they are expected numerous, which should be researched. How should they be researched or measured. These questions were summarized in three sub research questions.

- 1.1) *What are possible factors concerning an impact on Usefulness and Ease of Use?*
- 1.2) *Which of these factors are most suitable for further study?*
- 1.3) *How to operationalize and test these factors?*

Once the factors concerning the webtool are researched and the webtool is build, the question remains how well this developed webtool fits in the process of the YHPs and supports their task.

The second research question becomes:

2) *Does the webtool support the tasks and working process of the youth healthcare physician?*

Which also results in several sub research questions?

- 2.1) What are the tasks of the youth healthcare physician and what does the working process look like?
- 2.2) How can support be evaluated?
- 2.3) What are barriers or enhancements for a good fit?

The use of the webtool was evaluated in a situation where there was little or no other use of computers. At the time of this research a national project Digital Record Youth Healthcare program was rolled out, where all YHPs were switching to electronic administration of the VanWiechen scheme. The group of YHPs from Gouda had not yet switched. This meant that the fit of the webtool was to be studied in a situation without this Digital Record. This was relevant for the effort requested from YHPs using the webtool. Much data needed to be entered next to a regular hand-written dossier. In the future there would be no hand written dossier and the data entry would already be done in the Digital Record as a normal task. This meant the data entry was first experienced as doing things double, but with the Digital Record the use of the webtool would only require to click a button, since the data would have been already entered. This needed to be taken into consideration.

1.4 Relevance

This study adds scientific value as well as practical appliance. As stated above, Usefulness and Ease of Use are common items within IT adoption literature. However going one step backwards in what affects these two items, though some research has been done, still offers a large area of potential research. The study will research antecedents of the TAM model in the specific setting of webtools and youth healthcare.

Extending Usefulness and Ease of Use as influential factors for classic IT systems adoption to websites has been done [Heijden 2001] [Lederer 2000]. But the websites in these studies offer different functionality, resulting in outcomes inapplicable to healthcare webtools (for example the importance of information/content quality [Lederer 2000], while the webtool in this study offers no informational knowledge for the user). Though both a website and a webtool use a browser for information they distinct in the content they provide.

Both TNO and the staff of Youth Healthcare Gouda (*D*-screening population) reacted very positive towards attention for user friendliness generated by this study. Within the research proposal of the *D*-screening [Dusseldorf 2010] the acceptance of the webtool by the YHP is stated as an important aspect. Ease of Use and Usefulness are both contributing elements for acceptance. The outcome of this study will be used in the webtool for the *D*-screening and the evaluation will deliver insight in their project success.

1.5 Study context

This research has a clear connection with the TNO project. The relation between these two studies is explained briefly.

The *D*-screening was developed to support YHPs in more correct referrals for developmental disorders at a 9, 14 and 24 months. TNO was doing this in response to the notion of Integral Early Help Institution (VVI) that too few children were referred at an early age. TNO wanted to study the application of the *D*-screening in practice. The *D*-screening is a combination of the *D*-score and background information of the child. The *D*-score is a summarizing measure of entered VanWiechen items. The *D*-screening would be presented in a thermometer. Children with a positive score would be invited back for a second consult, where the webtool also provided the *D*-score in a graph (*D*-diagram).

The statistical computations as well as presenting thermometers and graphs make the use of computer software an obvious choice. And because the *D*-screening is tested on several locations and is used only for a limited time to perform the TNO research this software is realised in a webtool. Though TNO is familiar with the use of webtools as they also made a “growing curve” webtool, there was a request for extra attention towards the user experience. Developing the webtool should not only be done from a research instrument point of view, but also from the perspective of the YHPs and their effective and easy use of the webtool. In line with the attention for the user and user friendliness this research was performed. Where TNO is researching the instrumental effectiveness of the *D*-screening, this research looks at factors which make the webtool easy and useful.

1.6 Research Approach

The following paragraph presents the research plan. It consists of two research phases with several steps to answer the two main research questions.

Determining context

Before the research phases began it was important to understand the context of the research. Several subjects needed to be understood.

First it was needed to know what the YHP was doing. This is achieved by an analysis of the work tasks and process of the YHP. This was done as early as possible because it creates an understanding of the user, his activities and his goals. This was also needed to answer the first sub question of the second research question: *2.1) What are the tasks of the youth healthcare physician and what does the working process look like?* This understanding and familiarization will also improve communication with the users, the YHPs, about their needs and priorities.

The attitude of the YHP towards IT and computers in general was also briefly studied. Some relevant articles were used to form a picture about the relationship between YHPs and IT.

A basic description of the webtool was needed before the factors of the webtool could be researched or the testing setup could be developed. What functions should be available for performing the *D*-screening? A model was made with all the basic function descriptions for the webtool.

Research phase I: Webtool design factors

After the preliminary researches were done the first research phase started. This phase tried to answer the first research question: *1) Which factors impact the usefulness and ease of use of webtools for youth healthcare physicians?*

It consisted of several steps to answer the main research question and the sub questions.

Literature research

The first step was a literature research to determine what factors were mentioned or even researched by others to generate possible factors. The main goal of this step was to obtain a list of factors which influence Usefulness and Ease of use. This would answer the first sub question: *1.1) What are possible factors concerning an impact on Usefulness and Ease of Use?*

Determining factors

The literature research resulted in several factors possibly influencing Usefulness and Ease of Use. New factors were allowed to be added. The second sub question from the first research phase was: *1.2) Which of these factors are most suitable for further study?* From the list of

factors three were selected for further research, since it would have been too complex considering the resources to test all factors. Selection of the factors was based on the ability to vary them within this research and the factors needed to be solely independent variables.

Operationalization of factors

The final sub question was: *1.3) How to operationalize and test these factors?* Both the factors and the two items from the TAM needed to be made measurable. Through a second literature search we found measures and answered the first part of this sub question.

Statistical method selection

There were several ways to analyse the influence of factors on other variables. In this step the method for analysis was selected, which was dependent on the population size and data collection possibilities. It was also an ingredient for the second part of the sub question; how to test these factors?

Scenario building

The influence of the factors was tested and measured through the use of example webtools, called scenarios. These scenarios varied only on the different factors. The scenarios were worked out on paper.

Scenario testing

These scenarios were then presented to the research population. The research population consisted of ten people. Five of them were all the YHPs from the *D*-screening project who were going to use the actual webtool. Five other youth healthcare professionals, not related to the *D*-screening project, were tested as well to enlarge the population to a total of ten people. The testing was done through an interview. Each interview started with a standard introduction (see appendix D) followed by a few standard questions. Thinking out loud and free/broad reaction was encouraged and written down. The testing resulted in both quantitative information in the form of preference order for the different scenarios and qualitative information in the form of reactions from the YHPs.

Result analysis

The observations were analysed through the use of the statistical method, which was chosen earlier. The quantitative part and the qualitative part were used to complement each other in the interpretation of the results. The answers and reactions to the questions helped in understanding the factors and their influence.

Result implementation

From the results several conclusions were drawn which were translated into recommendations. The results were implemented in the final webtool used in the *D*-screening project.

Research Phase II: Webtool evaluation

The second research phase tried to answer the second main research question:

2) Does the webtool support the tasks and working process of the youth healthcare physician?

Again several steps were performed to answer this question and its sub questions.

Literature search

The second sub question was: 2.2) *How can support be evaluated?* To perform a good evaluation of the webtool a good framework was needed. Literature was addressed to look for topics concerning the evaluation of IT and processes.

Interview setup

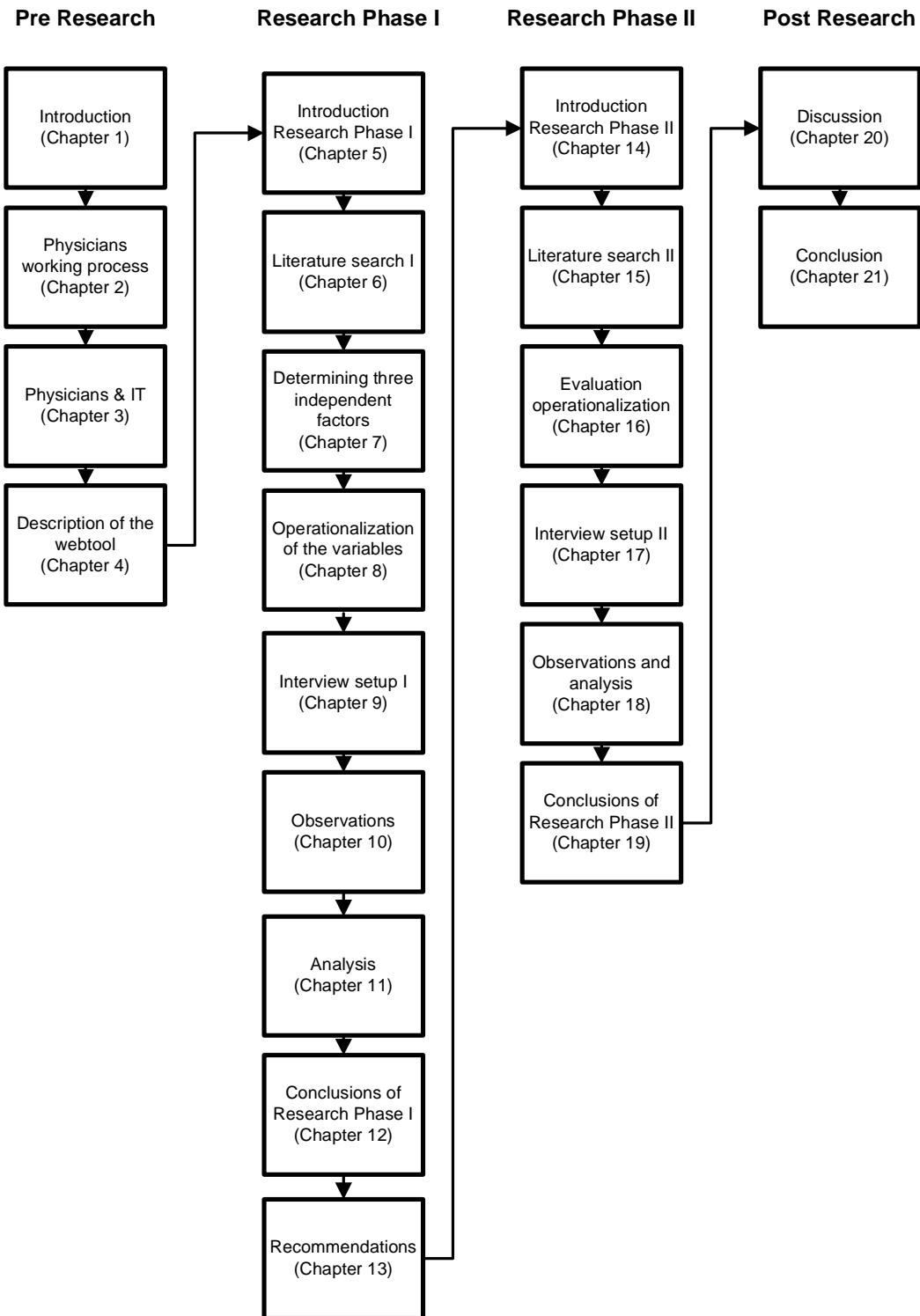
To answer the research question it is important to cover all relevant aspects of the webtool and its use by the YHPs. In this step a structure for the interview was developed and several aspects from the literature search were incorporated.

Interview results

After the YHPs were interviewed the data needed to be analysed and interpreted for evaluation. Based on these results, we could determine whether the final webtool (based on research phase I) was of good use. It also made the positive and negative aspects of the webtool clear which answered the last sub question: 2.3) *What are barriers or enhancements for a good fit?*

1.7 Structure

The rest of this report has the following structure. There are four major parts. The first is called pre-research with chapter 2 to chapter 4 giving context information. Chapter 5 to 13 encompass Research Phase I which looks for design factors of the webtool. Research Phase II is described in chapter 14 to 19 with the evaluation of the webtool. After the two research phases comes the section post-research with a discussion about the proceedings and results of the entire research is given. This is done in chapter 20. Chapter 21 presents the final conclusions and recommendations



Pre Research

2 Physicians working process

To understand the context in which the webtool is used, a short description of the YHPs task and working process is given.

The Centre for Youth Healthcare describes its goal in a similar way, to follow physical, social, psychic and cognitive development of children and youngsters and to signal disorders in these areas to provide early interventions. Tasks involving this goal are monitoring growth and the development of children, giving education, advice, instruction and counselling for the best possible development, the prevention of risks and early signalling of risk factors which threaten functioning, development and health. The report Basic Tasks Youth Healthcare gives an extensive description of the tasks [Verloove-Vanhorick 2002].

In practise these tasks are mainly performed during a consult at the child health care centre. The child is checked on several topics and depending on age receives vaccinations. The parents are given preventive consultation and advice related to test outcomes and the situation. To gain a better understanding a YHP was observed performing several regular consults. The activities of such a consult usually follow the same pattern. This makes it possible to map a regular consult. The proceedings of a consult are also visualised in figure 2.

2 Physicians working process

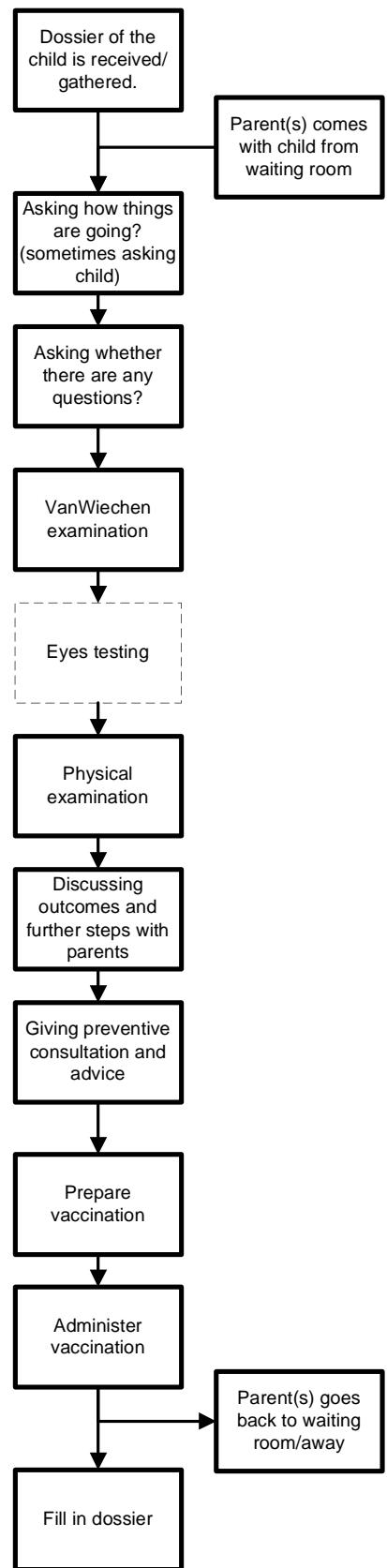


Figure 2 Proceedings of a consult

Before the start of a consult the necessary dossiers are gathered. Previous results, current age and situation determine following actions.

The parents and child are invited into the room of the YHP. The YHP asks the parents how things are going, checking the development in general and sometimes asking for specific areas. Through these questions the YHP gains a better understanding of the home situation and gains insight in aspects about the child which are not measurable through tests. If the child is a bit older, the YHP may ask the child after his or her well being directly. In this way the child is involved in the consult and its attitude is determined. A child who is shy or acts nervous requires a different approach than one very enthusiastic and excited. It is also important to make contact with a child to observe his or her mental and social skills. Parents often have questions of their own. If they don't start with questions themselves, the YHP asks if there are any questions.

When (if any) the general problems are discussed, several tests are performed. These are dependent on the age of the child and his or her development. For example eye testing is done at a later stage because the child needs to be able to tell whether it sees what the YHP is showing on a chart.

In some tests the child needs to perform a certain action. Most of these tests are part of the VanWiechen scheme. The VanWiechen scheme, the Dutch developmental test for young children, is a list of characteristics used as a standard for observing children in youth healthcare from birth to the age of 4. The YHP rates these characteristics either positive when the child performs the test correctly or negative when it is not performed. In special cases M, mentioned by parent, is allowed for when the child has displayed the necessary skills at home. Topic areas are 1) fine motor function, 2) adaptation, 3) personality and social skills, 4) communication and 5) gross motor function. When the child becomes older it is expected to be able to do more complicated tasks. The items which the child isn't expected to do at his age are grey. Sometimes children can perform these tasks, which are then also noted. This is needed so when the parent comes again, the then performing YHP knows these items have been noticed and the child has developed those skills. It also indicates a child is ahead in those topic areas.

Other checks are performed by the YHP, like physical body checks. During the observations the sequence of testing was fairly consistent, but this is not obligatory. A consistent way of working prevents that tests might be forgotten.

After testing and checking child development, the YHP applies vaccination. These need to be prepared. Both the preparation and appliance of the vaccination is done in the same room as the consult. During this time there is often further communication about the child, issues occurred during testing and worries of the parent.

After vaccination, the parent can take the (often crying) child back to the waiting room. The YHP now has time to fill in the dossiers. The reason why this isn't done during the consult is because it often conflicts with the interaction with the parent. The YHP has to stay focused on both parents and child.

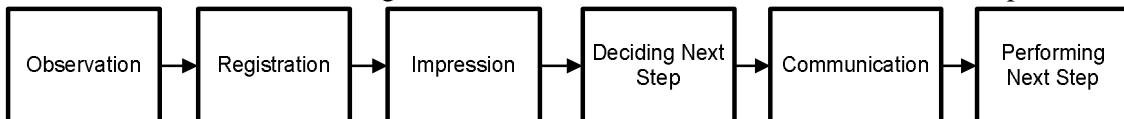
Some remarks need to be made to give a good feeling about a regular consult or to be remembered in the development of the webtool.

- An important aspect of the consult is that every child is different and acts different. Often children behave counterproductive. This requires patience, flexibility and creativity from the YHP. This leaves little room for attention for other activities.
- In the same way that children are different, so do also parents differ. Some are very independent and need little guidance. Some are not so self assured and need a bit more

guidance. The time needed for consult and explanation as well as which information is communicated depends on the parents.

- Sometimes the dossiers (graphs and test outcomes) are presented to the parents. This supports communication with the parent. In case IT is fulfilling the concept of a dossier, the display needs to be visible and suitable to parents as well.
- Another feature used in youth healthcare is that boys have green dossier maps and girls yellow. This may be used in the development of the tool.
- A final remark to give insight in the proceedings of a consult is that there are many activities to be performed in very limited time. A regular consult needs to be done in 20 minutes, which is very tight. When parents arrive late or when a situation asks for more time, this brings stress on the schedule. The use of a webtool consumes time, which is already scarce. During the TNO research, there is extra time available, but the design of the webtool needs to deal with this aspect beyond the TNO research. Although all YHPs are going to work with IT and the Digital Record in the Netherlands, adding more tasks and activities may burden the work process too much.

In the context of the *D*-screening, the workflow of the YHP is translated into six steps:



Observation – The YHP performs tests and checks the child's development.

Registration – The observed information needs to be registered. The VanWiechen scheme plays an important role.

Impression – Based on this information the YHP makes an assessment whether the child is doing well or if there is something problematic about the development.

Choosing next step – The impression leads to a certain action. The YHP has to choose what will be done in the current situation. If there is a clear problem, the child could be referred to the related specialist. If the problem is not clear, but the YHP feels the child needs a closer look a second appointment can be made.

Communication – The YHP communicates the impression and next step towards the parents and tries to explain and convince the best course of action.

Next step/Follow up – If the parent agrees, then a second step or action is taken. A very save step is to request an extra consult and spend more time on the issue. If the signs are clear then straight referral may be in place.

3 *Physicians and IT*

Adoption of IT is highly dependant on the user. The general attitude of the user towards IT is therefore very important. Several articles [Bhattacherjee 2007], [Spil 2004], [Poon 2004] have investigated the resistance of physicians towards IT. Physicians are very autonomous professionals, with good, often specialized training. They take great pride in their work. This means that everything which enhances their professionalism is embraced. On the other hand, anything which interferes or distracts them from their job is not appreciated [Anderson 1997]. Physicians are used to a great amount of autonomy. They have great decision power in the healthcare process and the working culture supports this. IT imposes certain limitations. IT changes the way physicians work, like the way medical data are recorded or organized. It interferes with the mental/thought process about the care of the patient/child [Anderson 1997].

The use of IT is often seen as bothersome and administrative. IT has to offer real value for the physician before it can be accepted. Chau and Hu [Chau & Hu 2002] discovered that physicians tend to be pragmatic in their IT adoption, meaning they focus on usefulness instead of ease of use.

The YHP places great emphasis on communication and interaction with both parent and child. The use of IT in a normal way, a desktop with keyboard and mouse, obstructs this communication during a consult. The attention of the physician is either directed to the child and parent or the screen. This makes them reluctant to operate computers during the consult.

Another aspect of being an autonomous professional is that any threat to power or control is not appreciated [Bhattacherjee 2007]. A webtool which offers a strong idea about the diagnoses or course of action can be seen as such a threat [Walter and Lopez 2008]. New technology can be seen as taking things over or physicians question the correctness of technologies outcome.

Within the adoption and acceptance literature there is also the factor anxiety or computer literacy. One study found that physicians were not lacking in this respect [Brown & Coney 1994] while another even mentions the early adoption of technology among physicians [Lowenhaupt 2004]. Though general attitude and self-efficacy may be positive, individuals sometimes differ in this respect.

YHPs may vary in attitude towards IT, but they all share enthusiasm for improvements in the quality of care and they are all reluctant to spend time on activities not focused on the child or parent.

4 Description of the webtool

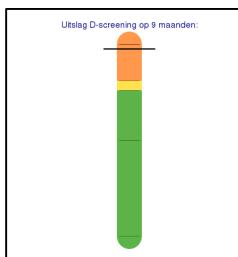
The word “webtool” has often been mentioned. In the following part some more lines will be dedicated to describe the webtool and its functions. Under paragraph 1.2 we described it as followed: *Webtools are applications based on a website, usually resulting in small and relatively simple systems. Using the system can often be done with very few frames/screens. In case of the D-screening all functionality is delivered in one page.*

This is still very general and will be made concrete here in respect to the *D*-screening.

The webtool had three functions. The first function was supporting YHPs in their monitoring and referring of children with possible developmental disorders. It would not be an instrument for diagnosis, but it would point out whether more thorough monitoring is needed. In this way it could also assist or confirm a YHP in his or her initial impression.

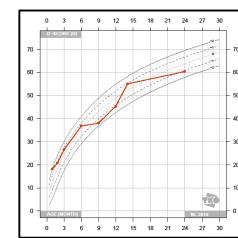
The second function was communication towards the parents. Parents are often reluctant to admit their child might have a developmental disorder. The outcomes of the *D*-screening could help to explain the situation and be an extra argument in convincing the parents about referral.

The third function was to store data for the TNO research.



The support of monitoring and referring was given in two functions; a *D*-screening in the form of a thermometer and a *D*-score in a graph (*D*-diagram). These two gave the YHP extra knowledge concerning the development of the child and help in communication with the parents. Both the thermometer and the *D*-diagram are results of data entered by the YHP.

For the research of TNO two more aspects were needed. Some administrative data like the date of the consult and name of the YHP, but secondly also the result of the consult. To measure whether the *D*-screening had effect TNO needed to know what the YHP would have done prior to knowledge of the *D*-screening outcome. This is called a JOI standing for YHPs Development Impression (“Jeugdarts Ontwikkelings Indruk” in Dutch). And also whether a referral took place or an extra consult was planned.



The webtool needs to fulfil these functions and consists in a basic form of these functions.

4 Description of the webtool

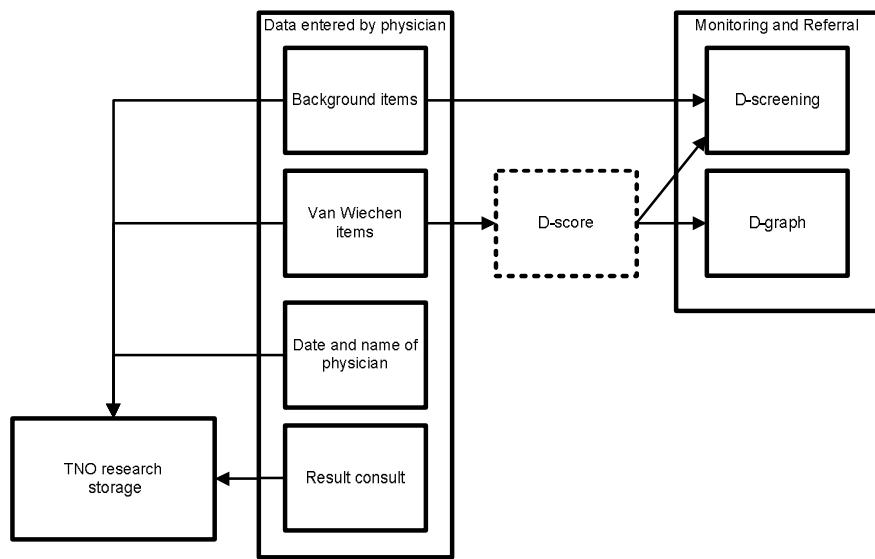


Figure 3: Model of webtool functions

Research Phase I: Webtool design factors

5 Introduction of Research Phase I

The goal of the first research phase was to uncover relevant factors for webtool use and test these with the YHPs. Research Phase I tried to answer the first main research question and its sub questions:

- 1) *Which factors impact the usefulness and ease of use of webtools for youth healthcare physicians?*

Paragraph 1.3 also explained the development of the following sub questions.

- *1.1) What are possible factors concerning an impact on Usefulness and Ease of Use?*
- *1.2) Which of these factors are most suitable for further study?*
- *1.3) How to operationalize and test these factors?*

At the end of Research Phase I the recommendations for the development of the webtool for TNO are presented based on the results of this phase.

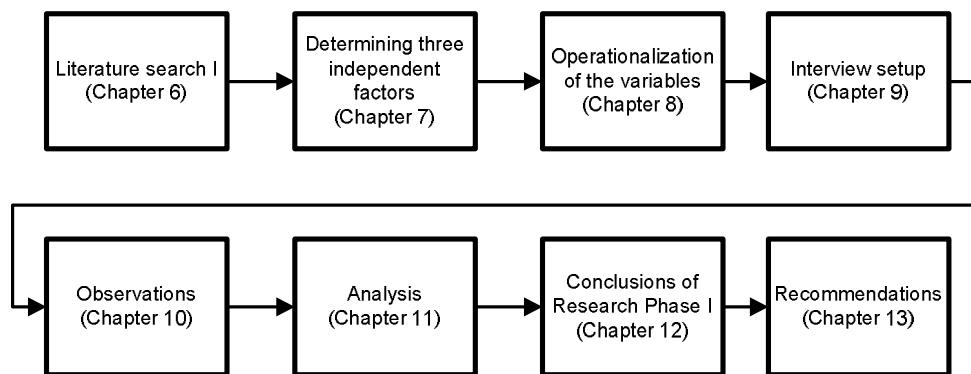
Plan of action

First several possible factors were gathered from a literature search, to see what others had written about factors influencing Ease of Use and Usefulness. From these possible factors a few were selected for further study. The remaining factors were operationalized in order to test their impact. Also Ease of Use and Usefulness needed to be operationalized, in order to measure the impact. Another literature search was performed to find measures for the factors and Ease of Use and Usefulness. Once the variables of the study are complete, we selected a (statistical) method for analyzing the observations.

The test was performed through the use of paper scenarios. Each scenario presented a webtool with different value settings for the factors and questions that were asked about Ease of Use and Usefulness. One part of the data was quantitative, used for statistical analysis. The other part was qualitative, giving room to broad information gathering. The analysis resulted in conclusions and recommendations, which were used in the development of the final webtool.

Structure

Phase I has the following structure.



6 Literature search I

The body of IT articles covering adoption and usability is large. In order to cover scientific literature on this topic both Scopus and Web of Science were searched. These two databases cover the top 25 journals with the exception of Communications of the AIS [Schwartz & Russo 2004]. This ensured the most influential articles were included.

In search for possible factors which might impact Usefulness the following setup was used.

Key words which where used in various combinations using OR and AND statements:

- usability, performance, usefulness, quality
- software, information technology
- indicat*, variable, factors, aspects, metrics, measur*, criteria, attributes

The search terms either gave too many results or no useful results. If there were no results another combination was tried. Through the use of queries the combinations where bundled to make sure everything was covered. This resulted in a 100000+ results. To narrow this down the subject areas which were not related to IT where removed.

In search for possible factors which might impact Ease of Use we used the following setup.

Key words which where used using OR and AND statements:

- Ease of Use
- factors, determinants, antecedents
- Information technology

The search gave a searchable amount of less then 300 articles. There were fewer useful results compared to usefulness search.

From the articles eight different themes were discerned.

- 1) Functionality delivered – the function the IT offers to the user.
- 2) Effort/ Efficiency – output in respect to the effort needed.
- 3) Task/ Activity tuned – whether the IT is adapted or organized for the tasks and activities of the user.
- 4) Interface layout – the looks and spatial organization of objects.
- 5) User support – various elements like training, help and service provided to the user, organizational support.
- 6) Information/ Content delivery – the quality and usefulness of information provided.
- 7) Flexibility – ease of operating (exit options, ease of correcting) and customization possibilities.
- 8) User Characteristics – attributes specific to each user, like motivation or attitude towards IT and self efficacy.

Table 1 summarizes how many times these themes were mentioned. The full list of articles is given in appendix H.

Table 1: Themes influencing either Usefulness or Ease of Use.

Article	Functionality delivered	Effort / Efficiency	Task/ Activity Tuned	Interface layout	User support	Information / Content delivery	Flexibility	User characteristics
# mentioned	7	7	6	9	11	5	6	2

7 Determining three independent factors

From the eight themes two factors were derived and one new factor was added. They were Functionality, Interface and Autonomy. Testing all eight factors would have been unfeasible for several reasons. With more variables to test, there would also be the need for a larger population for significant results. Resources were limited (both in time, money but also in available people working in the experimental group of the TNO project).

Several themes needed to be excluded. Exclusion was done based on two conditions. First a factor needed to be variable within this research, meaning it was possible within the resources or limitations posed by the TNO research. Secondly, it needed to be a clear independent variable.

The first theme, Functionality delivered, was selected for further study. Functionality seemed an obvious factor influencing usefulness. Providing the right functions contributes well to the usefulness of the software, thus it was expected to be a good factor. But the main functionality of the webtool was already provided by the TNO research, that is delivering the *D*-screening. However extra functionality or information could be delivered with the webtool to vary this factor. This is joined into one factor with information content/quality as can be seen in paragraph 7.1.

Effort/Efficiency was not selected for further study, since it was overlapping with a dependent variable in our research and therefore excluded.

Task/Activity tuned, similar to functionality, was difficult to vary with. The *D*-screening functionality dictated most of the outline of the activities. Some elements of the theme are incorporated in the operationalization of the chosen factors, due to overlap (for example interface layout and interaction based on activities of the YHP).

Interface or layout was a theme mentioned often. This was suitable for our study, because it was possible to vary with different looks/layouts. It is the second factor, see paragraph 7.2.

User support was mentioned most, but not selected for further study. Perhaps it was mentioned in many articles due to the grouping of training, organizational support and help desk support in one theme. Whether together as one theme or as individual themes they are very important factors. However they could not be influenced by this research, for example training is given to all people in the experimental group within the TNO research. There is no option for a control group. Different organizational support was beyond the scope of this research. Any intervention with the experimental group was unfavourable, because then the research from TNO would have to consider them as two different groups. Even though it could have been an important factor, User support was excluded for further study.

Information or Content quality was another theme inspired by several articles. Similar to functionality, it was already determined by TNO what information would be provided. This made it hard to vary. It has been merged with functionality; providing extra information or not (see paragraph 7.1).

Flexibility was a broad theme. It encompasses several ideas about being able to do what one prefers, for example correcting errors, moving through the software, customization options. Most of the ideas within flexibility were rules or principles, which should be considered when building a webtool. These are useful, but not suited for this study. These were difficult to test, since variation tended to be silly (allowing or prohibiting correction). What was useful was incorporated in a new factor, Autonomy, which is explained last.

The final theme from literature search was Personal Characteristics. This theme came from Ease of Use searches and was composed of motivational or attitude aspects of the user. The most common aspect was self-efficacy. Sometimes this theme is mentioned as influencing or

moderating factor for usefulness or ease of use. Sometimes it is mentioned as a direct influential variable for IT adoption. Though a very promising factor, it was beyond the scope of webtool development and hard to vary within the population of this study.

A third factor was added, Autonomy, because this is a key aspect in user-technology interaction and especially for YHPs. Physicians tend to be very autonomous in their work and this affects their attitude towards IT (see chapter 3). It incorporates some elements of flexibility, trying to make it into a more concrete concept, but on a higher level than just interaction rules. As a third factor it is explained in 7.3.

Functionality, Interface and Autonomy are the three factors for further study. The research model becomes as in figure 4.

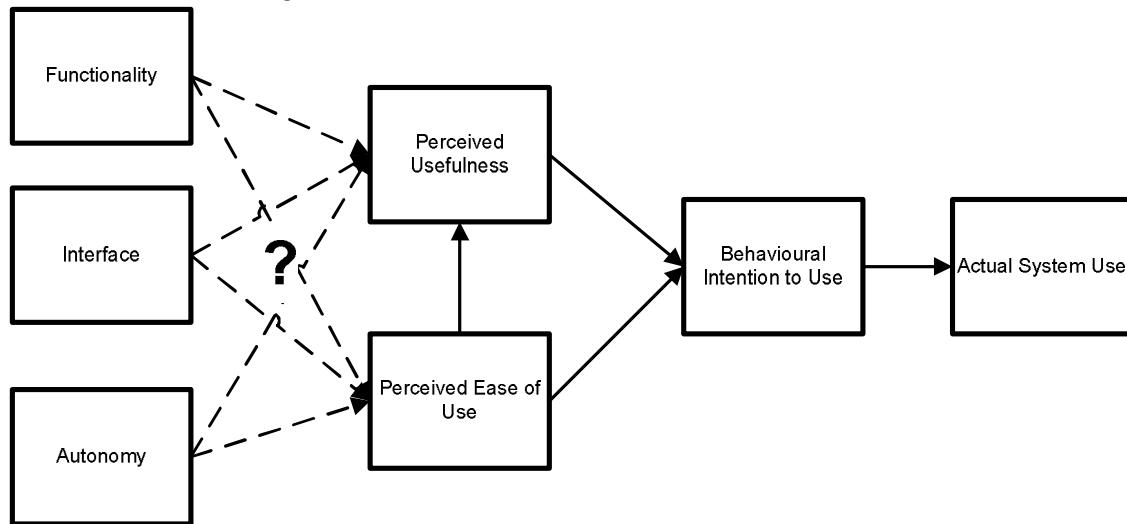


Figure 4: Research model with factors

7.1 Functionality

Functionality, as a factor, is the functions provided by the webtool. In chapter 4 the basic functions of the webtool were described and these could not be varied, since those functions were needed for performing the *D*-screening. Variation with Functionality would be based on extra functions which should prove useful, but were not necessary (see paragraph 8.1). The functions would be of a supportive nature because they needed to be useful and this also incorporated some aspects of User support. Since the extra functions were offering information, the theme Information/ Content delivery was partially included.

7.2 Interface

Interface layout was chosen as factor, because literature confirms its influence in other IT research. Since webtools tend to be small and simple, interface is a large component of what the development entails. The articles show its importance in both effective use (performing tasks faster and with less errors) and in user friendliness. This research studied whether this holds within webtools and with YHPs. Using different interface design principles a variation was made to test Interface (see paragraph 8.2).

7.3 Autonomy

A third factor was added, for which only one article was found [Walter & Lopez 2008]. The article presented a construct “Perceived threat to professional autonomy”. They defined this as “the degree to which a person believes that using a particular system would decrease his or her control over the conditions, processes, procedures, or content of his or her work.”

The results showed that it has significant negative impact on perceived ease of use and perceived usefulness. Especially the codification of knowledge, when the IT knows more than the physician, posed a great threat to autonomy. This factor is more important within healthcare than regular industries. YHPs are used to a great amount of autonomy and manage their own working process. The webtool used in the *D*-screening research offered support in the diagnoses, thus posed a threat. Because this was inherent to the functionality of the webtool, this could not be varied.

A view on autonomy which could be influenced was the prescriptiveness of the webtool. Prescriptiveness of a webtool was the extend to which the webtool or the user dictates/decides the working process. This touched the theme of flexibility above as well. As stated earlier the YHP can be anxious towards IT. A webtool requiring data entry could be seen as a hassle, especially when the user is not familiar with IT use. Whether a webtool should guide the YHP and be prescriptive or give complete freedom and grant the user autonomy were the variations for Autonomy (see paragraph 8.3).

8 Operationalization of the factors

For every factor another literature research was performed in search for indicators or measurements of these factors. These indicators would form the variation in different examples of the webtool, called scenarios. A scenario was a fictional version of the webtool, displaying the corresponding fictional website of the webtool on paper. This would help the YHPs to envision what user experience would be like, because they could see the webtool. This visualization offered the benefit of a more accurate gathering the opinion of the YHP above a narrative explanation of the variations. The YHPs understand the description of the different versions of webtools better which generates a more accurate opinion.

Interface had two variations, called Interface 1 and Interface 2. Functionality had two variations, called Functionality 1 and Functionality 2. Autonomy had three variations, Autonomy 1, Autonomy 2 and Autonomy 3. These variations resulted in twelve scenarios. The numbers correspond with low and high, meaning Functionality 1 had little or no functionality and Functionality 2 was the opposite, with high functionality. Autonomy 1 and 3 were extremes, with Autonomy 2 being in between. This allowed an easier description of a specific scenario. For example, A2F1I1 is the abbreviation of the scenario with medium autonomy, low functionality and a bad interface.

8.1 Method of analysis

The operationalization of the factors was interdependent of the means of measuring and thus the method of analysis. The number of items in the operationalization, size of the population, measurement scales and available time and effort from the YHP determined the selection of the statistical method.

Analyzing the relation between variables is commonly performed through regression analysis or analysis of variance [Moore and McCabe 2006]. In case of multiple independent categorical variables (called factors) influencing a single dependent continuous variable, an analysis of variance (ANOVA) is appropriate. An ANOVA covers every possible combination of independent variable settings.

The operationalization of the factors resulted in 12 scenarios. The constructs Usefulness and Ease of Use both have 6 items for measurement [Davis 1989]. An ANOVA would therefore result in a questionnaire with 12 scenarios x 12 items = 144 questions. This would have taken too much time and effort for the YHP to answer.

Reducing the number of combinations within ANOVA can be done through a so called Latin Square [Meerling 1997]. The Latin Square allows the removal of specific combinations in such a way that enough data is collected for each class for every variable. A usual Latin Square is formed by two factors. Three factors are possible, but require that all factors have the same amount of classes. Since the operationalization for autonomy had one more class than functionality and interface, this was not possible.

Removing a class from autonomy was not an option. The logical class for removal would have been Autonomy 2, the compromise, because at least the extremes have to be present. However Autonomy 2 could have been the most favourable option for the user, because the software gives some guidance, but the user still has a great deal of freedom. So the inequality of classes between the factors remained and the Latin Square could not be used.

Another option was reducing the number of items for the dependent variables Usefulness and Ease of Use. However these constructs are validated with these items [Davis 1989] and rating the scenarios with a single figure could prevent a distinguishable outcome. Various scenarios

could end up with a similar score and it would be difficult to determine which scenario was preferred over another.

Another method with a different setup is Multidimensional Unfolding [Coombs 1964] [Heiser 1981] [Busing 2010]. This method allows a small sample size. This method would ask the YHP to give a preference ranking for the different scenarios. This would result in two lists of twelve scenarios. One list ordering the scenarios from least useful to most useful and one list ordering the scenarios from least easy to use to most easy to use.

The result of Multidimensional Unfolding would be a graph with the different scenarios and the YHPs positioned in such a way that the distance between a YHP and a scenario corresponded to his/her preference. Scenarios which are preferred are positioned close to the YHP and vice versa. This graph is called a solution.

This method was used to analyze the opinion of the YHPs through the visualization of their preferences for different scenarios. Because the YHPs only needed to rank the twelve different scenarios for Usefulness and Ease of Use there was less time and effort required of the YHPs in the interview. Multidimensional Unfolding was done using Preference Scaling (Prefscal) [Busing 2010]. Prefscal is the most up to date version of Multidimensional Unfolding.

Selecting this option meant that Functionality, Interface and Autonomy could keep their classes and Usefulness and Ease of Use were bundled in one description.

8.2 Functionality

The operationalization of this factor was done by adding functions, because the main functionality of the webtool was already fixed. The construct was defined as:

Functionality is the degree to which functions are present in the software. More functions mean more functionality. A function is a feature supporting the execution of a task.

The functionality of the webtool is to store the data of the VanWiechen scheme and to give feedback through a thermometer and diagram. However to measure whether the users valued functionality some small support functions were developed and added. There were three such functions.

The help function; this gave information about the webtool, how it should be used, what different buttons or icons did etc. The idea was to be similar to most help functions in software today. The idea was that because the YHP was new to the webtool and perhaps new to IT in general a help function would matter. The example help used during the interviews can be found in appendix C.1.

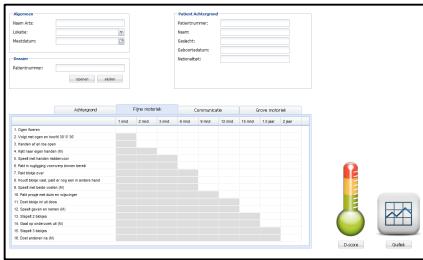
The action function was another one (see appendix C.2). Children who have disabilities need to be referred. Within healthcare there is a broad range of specialists, protocols and work plan involved. This function would sum up useful information like phone numbers, websites etc as a quick reference to aid the YHP in referring a child.

The third function was background information about the VanWiechen items (see appendix C.3). What was to be measured, when, how etc. Some extra backup information could prove useful since there are 72 different items.

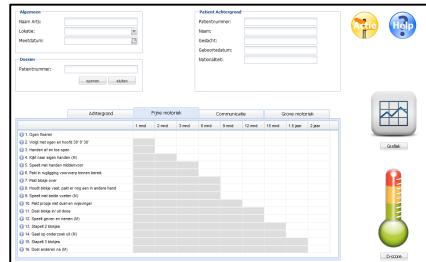
All added functionality was fictional, though inspired by material actually used in youth healthcare.

This leads to two classes in measuring functionality. Either a webtool with or without these extra functions. The version with extra functionality was called Functionality 2. The version without extra functionality was called Functionality 1.

Without added functionality:



With added functionality:



8.3 Interface

Two sources of information have helped the operationalization of this factor. Scientific literature offers a few ideas and concepts for measuring interface. Next to these articles there are also publications of software developers. Three aspects of interface were used from these articles to distinguish a good interface from a bad interface.

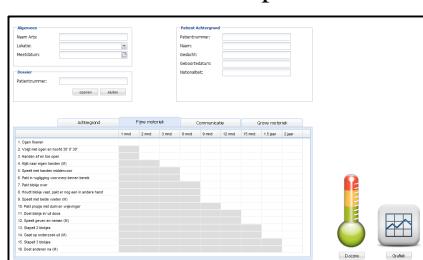
The first one was alignment. Alignment is whether different objects on screen are on the same line. Good alignment is related to a better interface [Parush 2005] [Ngo 2003].

Another aspect was flow or sequence [Ngo 2003] [UXGuide 2009]. This relates to whether the objects needed in a task or process are also in the order/sequence of that task or process. Usually this sequence goes from left to right and from top to bottom, similar to western reading style [UXguide 2009]. For a good flow the administration data was top left, followed by the VanWiechen scheme and ended with the results/feedback thermometer and diagram on the right/bottom.

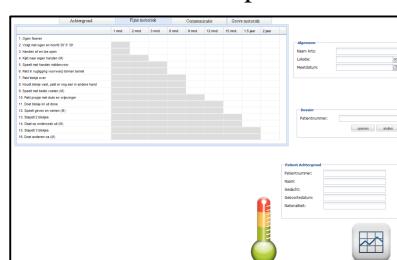
The last aspect was different font types. Many different font types and sizes cause less simplicity and create a worse interface [UXGuide 2009].

These three aspects were the main variations in interface for the different scenarios. All three aspects were used to make two variations, a good interface or a bad interface. The bad interface, with no alignment, no flow and different font sizes is called Interface 1. The good interface, with alignment, flow and a uniform font is called Interface 2. Other concepts may have been included, since more guides and articles where read and perhaps unconsciously applied, like order, balance or simplicity [Ngo 2003] [IBM 2010].

Good interface example:



Bad interface example:



8.4 Autonomy

Autonomy as opposed to prescriptive IT is the ability of the user to do what he or she wants. This is also closely related to flexibility [Wiklund-Engblom 2009]. Allowing great navigational freedom and offering a wide range of possibilities/functions offers autonomy. The construct autonomy was defined as follow:

Autonomy is the ability to freely operate and navigate within the system.

Interaction with the webtool basically consisted of two actions. The first action was data entry by the YHP. First administrative data was entered, followed by filling in the items of the VanWiechen scheme. The second interaction was when the webtool gave feedback in the form of a thermometer or diagram. The first action was used to vary autonomy.

In this study autonomy was operationalized in three classes.

The first class was low autonomy (related with high prescriptive IT). The webtool asked one item at a time. After the data was entered the next item was asked. Other items could be searched manually, but this was not easy. In this class, the webtool dictated what should be done. This version was called Autonomy 1.

The second class is a compromise. The user had the total overview of the VanWiechen scheme, but was also guided by the webtool. Missing administrative data was shown as red and needed to be entered before the user could proceed. Within the VanWiechen scheme the requested items were given a yellow colour, but other items could be selected as well. This version of autonomy was called Autonomy 2.

In the third class the user received total freedom. Again there was a total overview of the VanWiechen scheme. However there was no guidance from the webtool and the YHP could fill in whatever item he or she preferred. This was called Autonomy 3.

8.5 Usefulness

Usefulness was derived from TAM [Davis 1989]. The article presented six validated items to measure the construct usefulness:

1. Work more quickly - Using ... in my job would enable me to accomplish tasks more quickly.
2. Job Performance - Using ... would improve my job performance.
3. Increase Productivity - Using ... in my job would increase my productivity.
4. Effectiveness - Using ... would enhance my effectiveness on the job.
5. Makes Job easier - Using ... would make it easier to do my job.

6. Useful - I would find ... useful in my job.

The word usefulness was translated with “effectiviteit” in communication with the Dutch YHPs, which corresponds with “effectiveness”. This was one of the six items Davis used to describe usefulness. The word “effectiveness” was used, because it covered the meaning better than the precise translation.

During testing Usefulness of the webtool was formulated as follows (translated from Dutch):

Effectiveness means whether the webtool increases the quality of your work. Allowing you to perform more tasks correctly. Example: being able to enter data correct and quickly.

This description tried to bundle item 1 “Work more quickly” and 3 “Increase productivity” in *perform more tasks* and *fast entry of data*. Item 2 “Job performance” was represented by *improves quality of your work* and *perform tasks correctly*. Both “Effectiveness” and “Useful”, item 4 and 6, were covered with the word *effectiveness* itself. Only item 5 was not transformed into the description, because it might have proven confusing for the YHPs with the Ease of Use variable, when the formulation as it is covered the concept sufficient.

8.6 Ease of Use

The term Ease of Use also stemmed from TAM [Davis 1989]. Perceived ease of use had also six items.

1. Easy to learn - Learning to operate ... would be easy for me.
2. Controllable - I would find it easy to get ... to do what I want.
3. Clear and understandable - My interaction with ... would be clear and understandable.
4. Flexible - I would find ... to be flexible to interact with
5. Ease to become skilful - It would be easy for me to become skilful at using ...
6. Easy to use - I would find ... easy to use.

The term Ease of Use was translated with “gemak”, which corresponds well with ease. These six items were used to formulate one description of Ease of Use (translated from Dutch).

Ease is whether the webtool is easy to handle (operate). Is the webtool clear, understandable, easy to learn. Is it easy to do with the webtool what you want to do?

The first sentence, *easy to handle (operate)*, covered item 2 “Controllable” and a bit of item 6 “Easy to use”. Item 1 “Easy to learn” and 3 “Clear and understandable” were bundled in the second sentence, listing *clear, understandable and easy to learn*. Item 2 was also used for the last sentence in being able to *do with the webtool what you want to do*.

9 Interview setup I

9.1 Method

The interview would measure the preference of the YHPs by letting them order the twelve scenarios for Usefulness and Ease of Use. Scenario material can be found in appendix C. This was complemented with a qualitative part, consisting of five questions and the reactions of the YHPs during the interview.

The measurement was done through a structured face-to-face interview with YHPs. Because the interview was more or less the first communication towards the YHP about TNO and the D-screening project an introductory story was written down (see appendix D). This story was told at the start of every interview. After the story an explanation of the interview and how it would support the development of the webtool followed.

By showing a few different scenarios the different scenarios were explained. The global variations were mentioned, but the independent variables were not mentioned explicitly. For example the difference between a good interface scenario and a bad interface was that they looked different or had a different layout. Autonomy was explained as ways of entering the VanWiechen scheme, either through question or through an entry field (with or without support). Functionality was explained as added options or functions.

This was followed by explaining the measurement of preference. The two measurement variables Usefulness and Ease of Use were explained and the YHP had to order the twelve scenarios to each variable. Once the scenarios were ordered the order was checked together with the YHP to make sure this was the order they meant. This allowed the YHP to recollect his or her given preferences and correct the order when they saw fit. First Usefulness was ordered, then the scenarios were shuffled and the YHP had to order them for Ease of Use. After the YHP ordered for both variables five questions were asked to help the interpretation and trigger more response to aid the development of the webtool. The preference order for Usefulness and Ease of Use as well as the questions were written on a structured form (see appendix E). The YHP was encouraged to think out loud and react freely during the entire interview. These reactions were noted down as well.

9.2 Pilot Interview

The interview was tested on a non-YHP. This was to test for duration and practise administering the interview. The non-YHP had no trouble sorting the twelve scenarios. Most important feedback was to explain the two variables Usefulness and Ease of Use well.

During the first interview the YHP noted that the two variables can be confusing, that he/she mingled a bit of Ease of Use into the preference order of Usefulness. The YHP explained that an easy process relates to a faster performance. In the following interviews both the two terms were explained with emphasis before ordering was done so the YHP understood both and the difference. Repeating the terms related to Usefulness or Ease of Use was done when the YHP asked for it. They were also repeated if they pondered for a long time to help the YHP keep the variable good and distinct from the other variable. This was done to recuperate the variables. Terms used for this were for Usefulness: *Performing more tasks accurately, better, correctly*. For Ease of Use it was: *Clear, easy to learn, easy to do in the webtool what you want to do, easy to use*.

9.3 Sample

The population of the first research phase consisted of ten youth healthcare professionals. Five of them were YHPs who would be working with the webtool and participated in the TNO project. YHPs from the *D*-screening project who were in the control group were not allowed to be interviewed, because they were not to be informed about the webtool and the *D*-screening. These five YHPs were also the total number of physicians starting in the experimental group of the *D*-screening project. Another five youth healthcare professionals (four physicians and one nurse) were interviewed to enlarge the population size. These were not related to the TNO *D*-screening. They did receive the same interview with introductory story to keep the context identical. Later during the *D*-screening some new YHPs filled in places for others, but these were not interviewed.

10 Observations

The preference order of the YHPs tended to be similar for Usefulness and Ease of Use. The preferences and comments are presented in appendix F.

Table 2 is a summarization of the preferences, listing the median of the preference for the scenarios. The abbreviation A2F2I2 stands for a scenario with medium Autonomy, high Functionality and a good Interface (see also chapter 8).

Table 2: Average ranking of the scenarios by youth healthcare physicians

Usefulness		Ease of Use	
A2F2I2	1	A2F2I2	1
A2F2I1	2,5	A2F1I2	3
A3F2I2	3	A3F2I2	3,5
A2F1I2	4	A2F2I1	4
A2F1I1	5,5	A2F1I1	5,5
A3F2I1	6	A3F2I2	6
A3F1I2	6,5	A3F1I1	7
A3F1I1	8	A3F1I1	8
A1F2I2	9	A1F2I2	9
A1F2I1	10	A1F2I1	10
A1F1I2	10	A1F1I2	10
A1F1I1	12	A1F1I1	11,5

The YHPs chose scenario A2F2I2 as the best for Usefulness, nine out of the ten respondents placed it as the most preferred. Overall Autonomy 2 was preferred most. These were the webtools with a compromise between guidance and freedom. They had the full VanWiechen scheme, but the webtool signalled which items were required and lined red what was forgotten. Autonomy 3 came second, giving total freedom with no support. Autonomy 1 was last, which had the webtool asking questions instead of the full VanWiechen scheme. This means that a compromise between freedom and guidance is thought to result in the most useful webtool.

Functionality 2, with added support functions, was ranked higher than Functionality 1, without the support functions. This can be seen with any combination of Autonomy and Interface.

Interface 2 was also ranked higher than Interface 1, preferring a better interface. While preferring something which is better seems obvious, it is important that the YHPs could clearly distinguish the difference.

Another aspect is priority. Autonomy had the highest priority, YHPs ordered the scenarios on this variation first. The position of the scenarios in table 2 is also determined mostly by Autonomy. Second priority went to Functionality. The preference on Interface was given the lowest priority, since it affected the ranked position the least.

For Ease of Use we see a similar preference. A2F2I2 is again the most preferred. Again Autonomy 2 is chosen over 3 and 1. However Autonomy 1 was given more attention under Ease of Use compared to Usefulness. The webtool asking VanWiechen items adds the least to Usefulness, but had little more appeal for making the webtool easy. Functionality is the second most deciding attribute of a scenario for Autonomy 2 and 3 (full VanWiechen

10 Observations

scheme). This makes the difference in priority less significant, with just Autonomy as clear primary factor for preference.

More information was derived from the individual preferences of the YHPs which are presented in the next chapter.

11 Analysis

The analysis consists of a quantitative part in 11.1 and a qualitative part in 11.2 which complement each other.

11.1 Quantitative Analysis

The factors Autonomy, Functionality and Interface were incorporated in twelve scenarios. Through the use of Multidimensional Unfolding the preferences of the YHPs was made visible.

There were two questions concerning the relation of the three factors on Usefulness and Ease of Use. Does a factor have an impact? If so, how big is that impact? Another relevant question was which scenario is preferred the most, because those factor-values are the best combination. And finally whether YHPs are a uniform group, with a coherent preference or whether they prefer different aspects of a webtool. In the following paragraphs the four questions are answered for Usefulness and Ease of Use.

Multidimensional Unfolding was used to analyze the impact of the factors. Multidimensional Unfolding tries to position different objects at correct distances, having those distances correspond as good as possible to the original preferences. The solution is a compromise between all objects and their preference, because it is positioned in a two dimensional space. This compromise is called stress. When the distances in the graph correspond well with the observed preferences, there is little stress. Bad correspondence gives increased stress.

To see if the preferences of the YHPs were impacted by the factors it was determined whether the factors fit in the solution well. This was done by looking at the difference in stress between two solutions. One solution without the factors influencing the position of the scenarios (called unrestricted) and one solution with the factors influencing the position of the scenarios (called restricted, because the factors restrict the scenarios). If there is little/no increase in stress, the factors fit naturally in the solution and correspond to the YHPs' preferences.

The R^2 of a factor give an indication of the impact, since R^2 represents how well the factor explains the positioning of the scenarios in the solution and thus its importance.

The location of the YHPs and the scenarios will also be used to gain further insights. The full description of the process of generating solutions is presented in appendix A. For a full explanation of the use of Multidimensional Unfolding see appendix B.

11.1.1 Analysis for Usefulness

First the unrestricted solution for Usefulness is analyzed (see figure 4). The YHPs and the scenarios are positioned in such a way that the distance corresponds to their preference. The factors are present (drawn in the graph) but do not influence the positioning. The scenarios with Autonomy 1 are on the left in the graph with the Autonomy 3 on the right. In the middle are some Autonomy 2 and Autonomy 3 scenarios located closely together. Functionality 1 is located high in the solution and Functionality 2 is located low in the solution. The variation of Interface is placed more random (though the factor is placed diagonal from top right to bottom left).

The YHPs are mostly grouped up between Autonomy 2 and 3 and more on the Functionality 2 side. One YHP (B) is located closer to Autonomy 1.

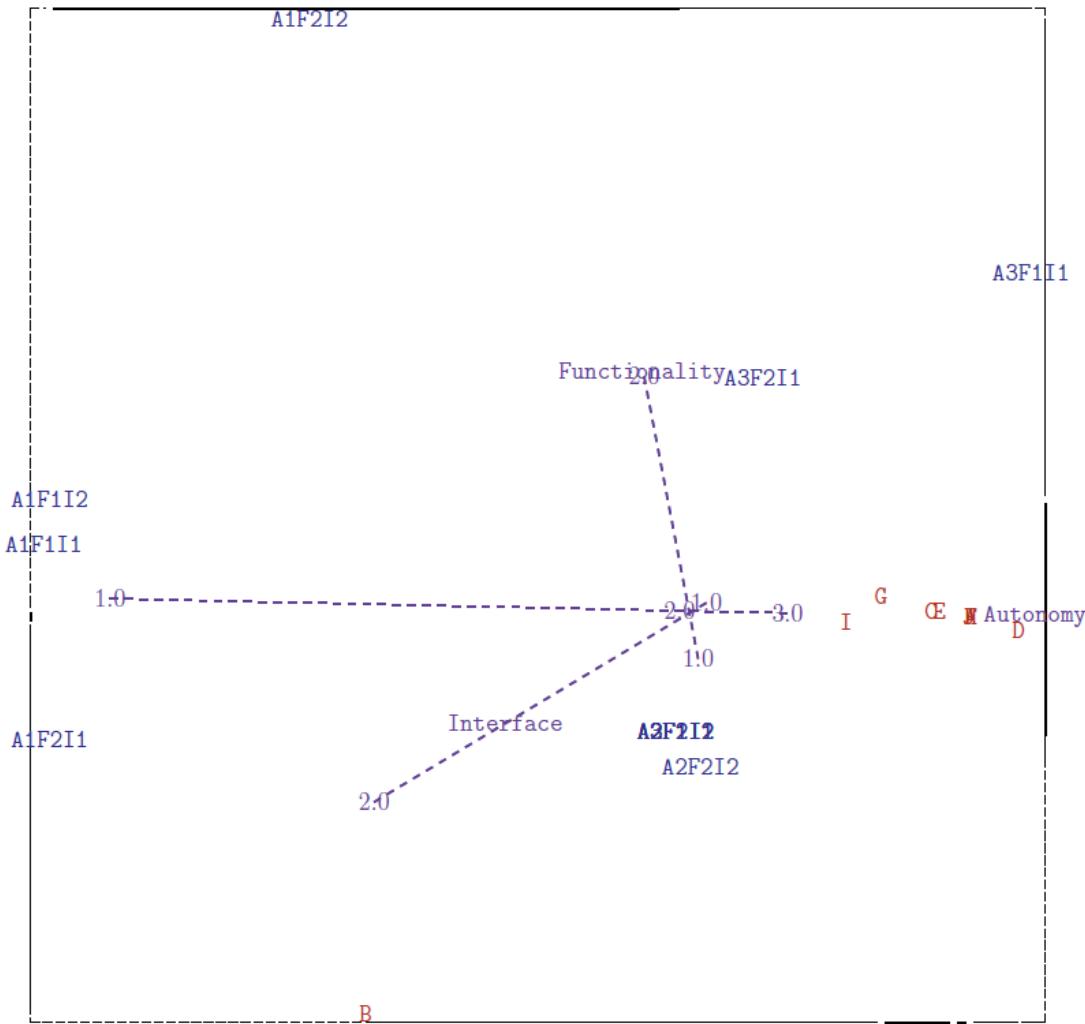


Figure 5 Usefulness: Unrestricted version

The *stress* for unrestricted was 0.0003 and for restricted 0. There was no increase in stress and the *stress* stayed well within boundaries, so the factors fit the solution space well.

The R^2 values within the unrestricted solution were:

- Autonomy: 1
- Functionality: 0,701
- Interface: 0,632

This means that the placement of the scenarios follows the factor Autonomy perfect, meaning the scenarios were preferred in correspondence to Autonomy. The R^2 values for Functionality and Interface were lower, but still significant. Interface has the lowest value which is also displayed in the graph by appearing random. Still both fitted well on the solution space and explained the variation in preference well. These R^2 values also give an indication of how large the impact of the factors is and how large compared to each other. This shows that YHPs preference for the different scenarios was based mostly on autonomy. Functionality was a good second important factor and interface was least important.

With the factors established a restricted version (where the factors were incorporated into the solution) is useful for a better interpretation (see figure 5). The graph is very similar to the unrestricted solution. Autonomy has been reversed, with scenarios with Autonomy 3 on the left and Autonomy 1 on the right. Scenarios with Functionality 2 are located at the bottom.

Autonomy is placed diagonal from bottom right to top left. Functionality and Interface are both placed from top to bottom. Most YHPs were located near scenarios with Autonomy 2 and 3, with also one (YHP B) leaning more towards Autonomy 1. YHPs prefer scenarios with Functionality 2 more than Functionality 1. This is similar in case of Interface.

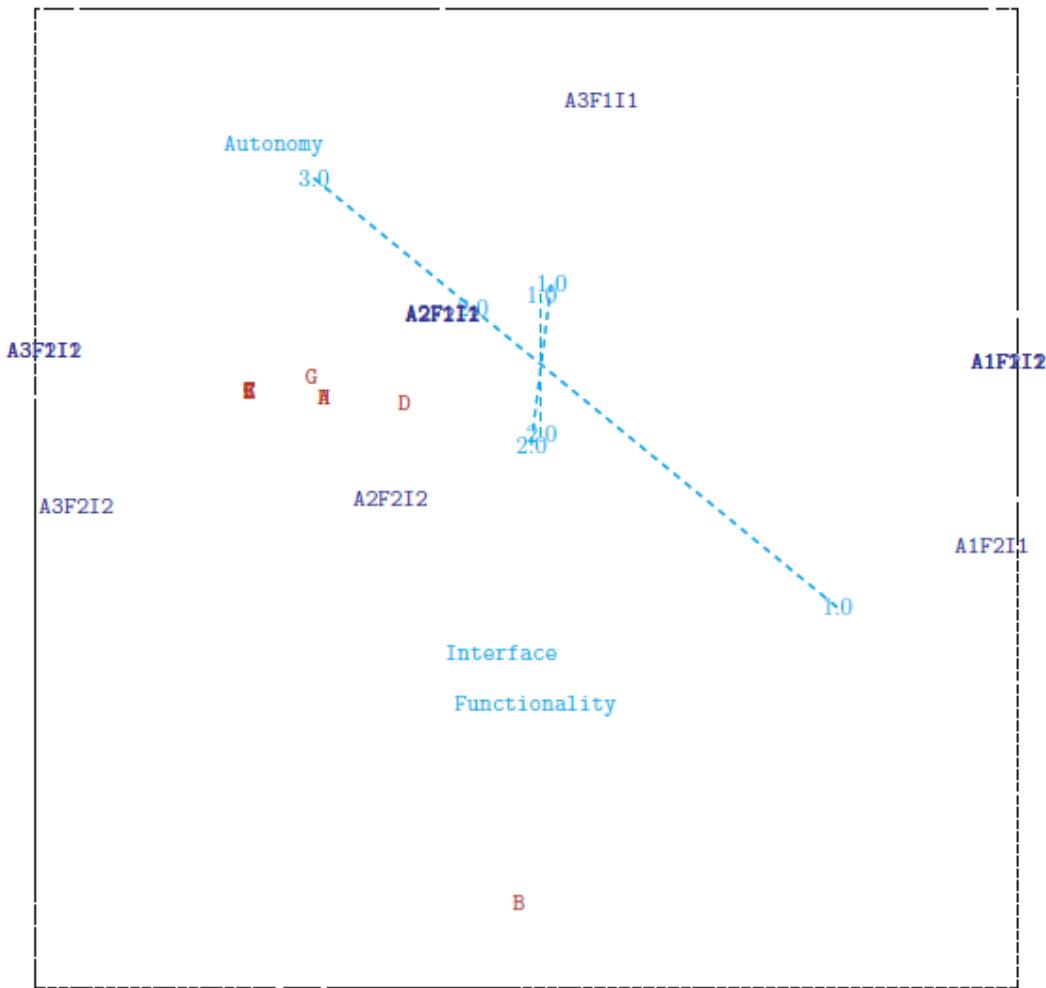


Figure 6 Usefulness: Restricted version

At the end of the interview the YHPs were asked which scenario they preferred most. This was to determine what values for the factors are best. For Usefulness they chose unanimous for scenario A2F2I2. Within the graph this is shown by the short distance from every YHP towards A2F2I2. Some other scenarios are positioned close as well, meaning these are decent alternatives.

The combination of the optimal webtool could be determined by projecting the YHPs on the factors (see figure 6).

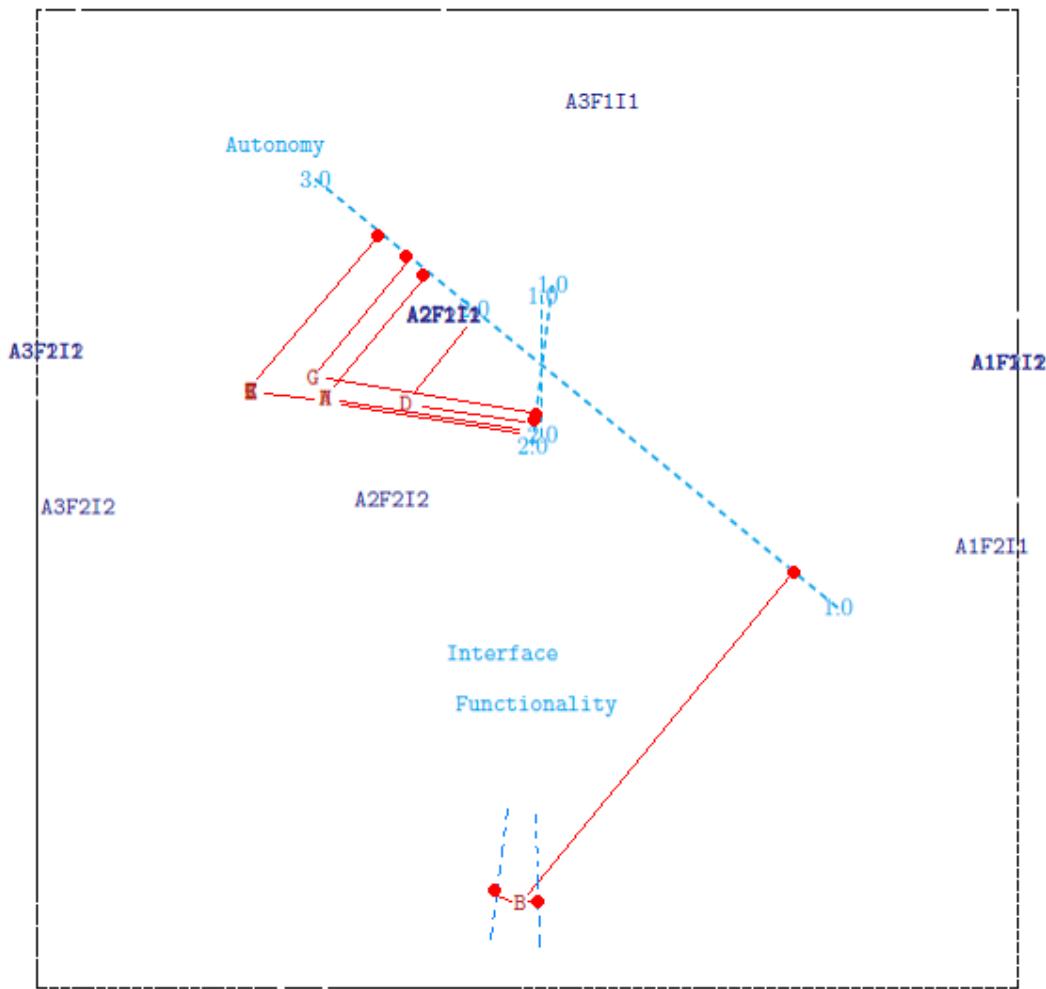


Figure 7 Usefulness: Physicians preference projected on the factors.

For Autonomy the optimal webtool would range between 2 and 2.6, with only one YHP close to 1.2. This means that most YHPs thought the extra guidance was good, bringing them closer to Autonomy 2 than 3, but a little less guidance would be perfect. For Interface and Functionality we see similar outcomes. Almost all YHPs thought somewhere between 1.6 and 1.9 would be optimal for Functionality and Interface. Translated into webtool characteristics this would mean extra functions and a well designed layout mattered, but a little less would have been fine. It is important to remember that unfolding gives a representation of the preferences. It is not perfectly corresponding to the original data and the figures are an estimation for optimal factors. It is also unclear what 1.6 means for Functionality. For example it does not translate itself directly to removing one function from Functionality 2. Also one YHPs (AG) was placed far beyond Functionality and Interface 2. This doesn't mean she would like to have an interface which is ten times better or that she would like to have ten extra functions instead of the three given. It means she heavily relied on these two factors in her preference. Also, because the solution is a compromise between all data and one object could be out of place, one should not place a large emphasis on one person or scenario. These projections give an indication of what the perfect webtool would be.

Looking at the location of the YHPs we saw that almost all YHPs were located close together. This meant that for Usefulness YHPs were very uniform in their preference of scenarios. This meant that one webtool can obtain factor-values which appeals to all YHPs. And that in appreciation of the webtool they were not very distinct from each other.

11.1.2 Statistical analysis Ease of Use

The same steps were applied for Ease of Use. Figure 7 displays the unrestricted solution for Ease of Use. Scenarios with Autonomy 1 are left and Autonomy 3 to the right and bottom and Autonomy 2 in the centre and a bit higher. Functionality is placed from top right to bottom left. The scenarios with F1 are placed high and scenarios with F2 are placed low. Interface is placed from top to bottom, but this is again not recognizable in the scenarios.

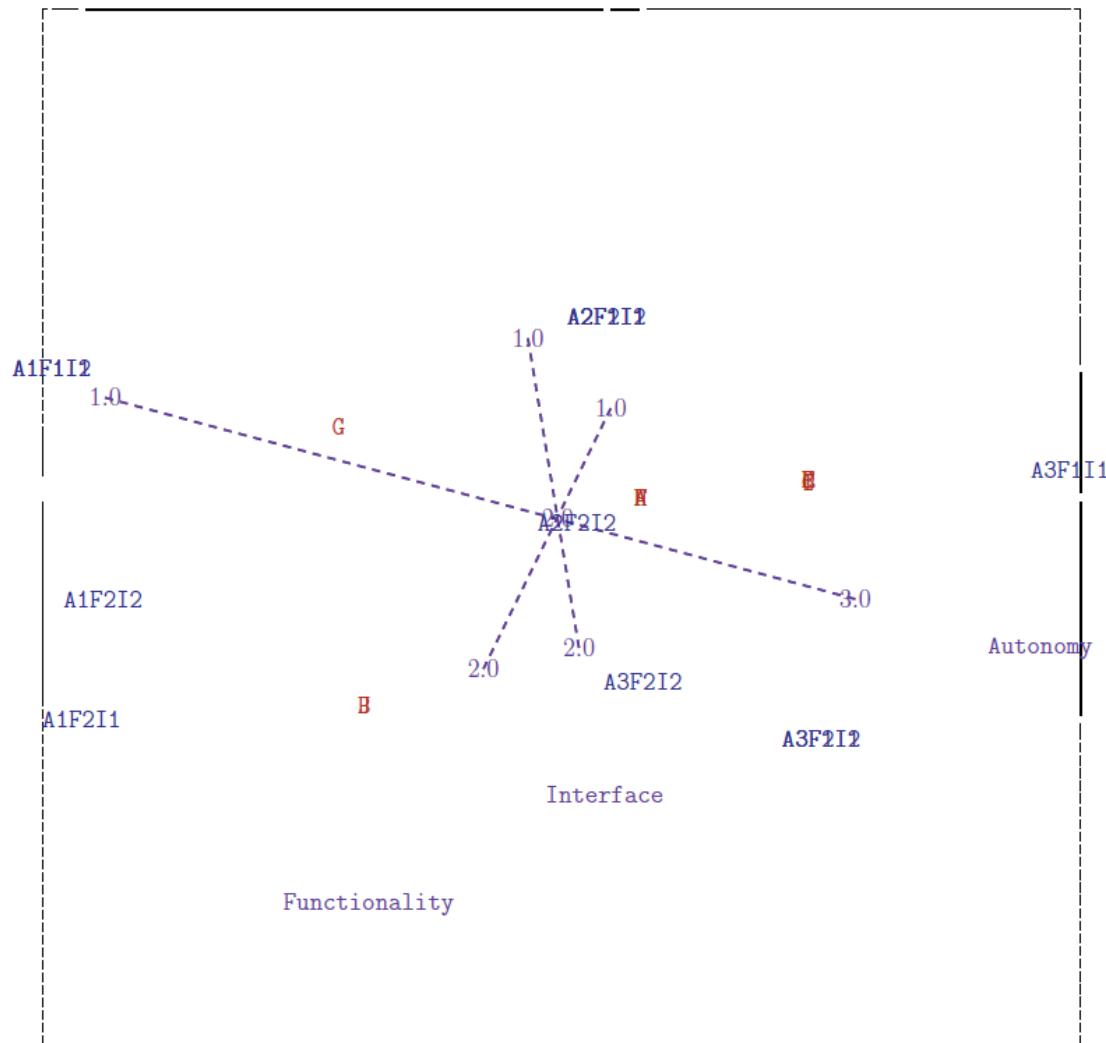


Figure 8 Ease of Use: Unrestricted version

To determine whether a factor had a large impact we again looked at the transition from a unrestricted setting to restricted setting and the corresponding change on stress. The transition for Ease of Use gave an increase from 0 *stress* in unrestricted to 0 *stress* in

restricted. This is no increase and again within boundaries. This means the factors fit as good in the restricted version as in the unrestricted version, meaning the fit well.

The R^2 for the three factors in unrestricted were:

- Autonomy: 1
- Functionality: 0,863
- Interface: 0,562

This shows that Autonomy and Functionality dictate the location of the scenarios and were important during the ordering by the YHPs. Interface played a modest role. Autonomy has the same R^2 value for Ease of Use and Usefulness. Functionality plays a greater role in Ease of Use. Interface becomes less important compared to the other factors.

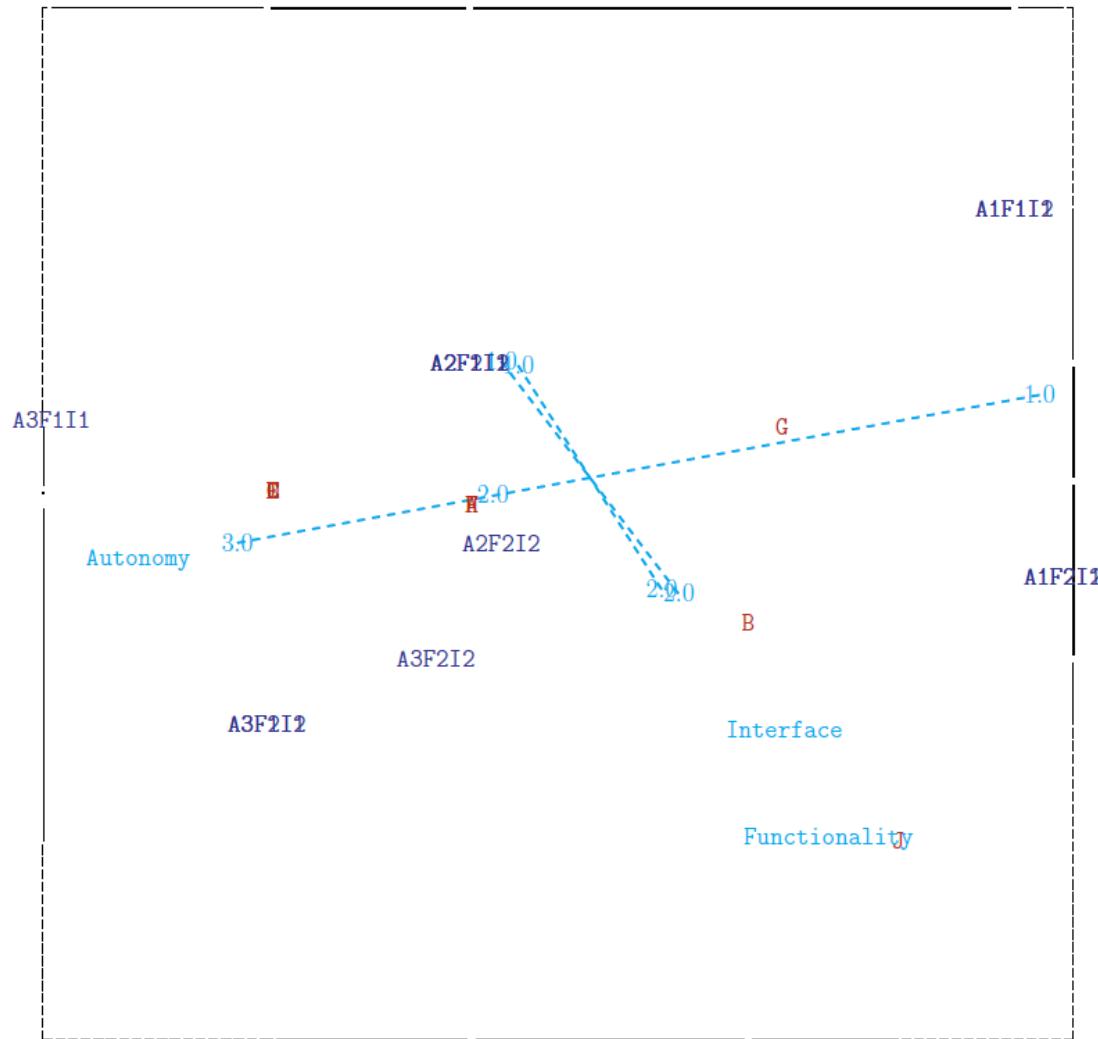


Figure 9 Ease of Use: Restricted

The restricted solution shows a spectrum on which the different YHPs positioned themselves. This is easier recognized in figure 9, where the YHPs are projected on the factors. Some YHPs choose high autonomy, with little need for extra functions or good interface. On the other side of the spectrum are YHPs who chose the low Autonomy (webtool asked the

questions) with high Functionality and Interface (clear order and extra help button). There were also some YHPs more in the middle. So both high Autonomy and low Autonomy was favoured by some for Ease of Use. Functionality and Interface were also favoured both high and low. This displayed a difference in attitude towards ease of use. Some YHPs found the webtool easy to use if it was flexible with freedom to operate. They do not require assistance from the webtool. Other YHPs embraced all the support they could get, because the assistance from the webtool made work easier.

The YHPs preferred scenario A2F2I2, which is also visible in the picture. It is located in the centre of the YHPs (and in the centre of the graph), with several YHPs very close to it.

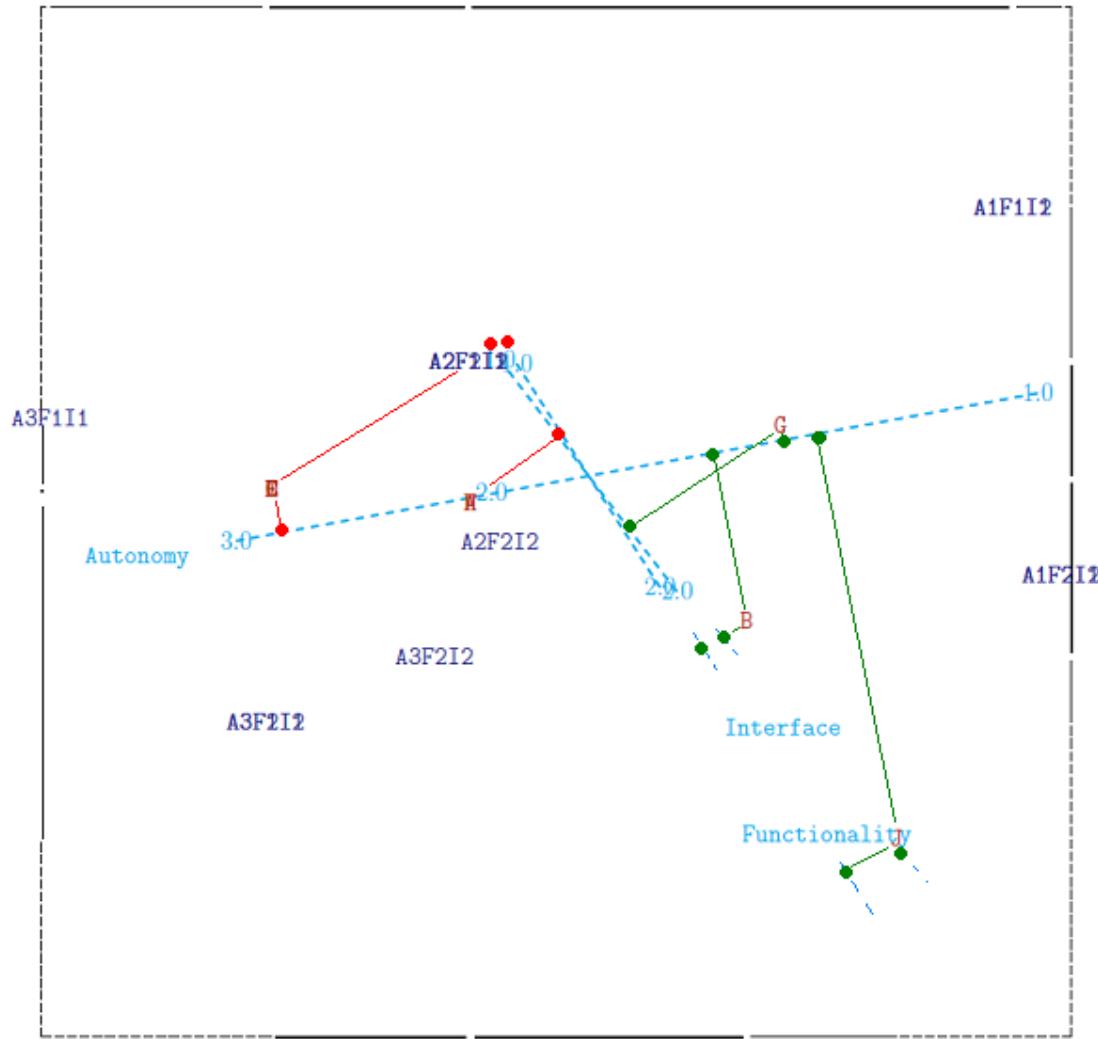


Figure 10 Ease of Use: Physicians position projected on the factors

Compared to Usefulness the YHPs are more spread out for Ease of Use. Where Usefulness had one YHP clearly deviating from the group, with Ease of Use there is more spread in the YHPs position and thus preference. In the projection of the YHPs on the factors we can clearly see the two different attitudes. The red projections are YHPs who think of Ease of Use as independence, flexibility, autonomy. The green projections are YHPs who thought of Ease of Use as help and assistance from the webtool.

This means there is less clearly one webtool which is optimal for all the YHPs. An average would not necessarily mean the best pick. Even if two webtools were made for these two opposites the YHPs are still too spread out to have such an optimal combination as for Usefulness.

11.2 Qualitative analysis

From the qualitative data of the interviews several conclusions can be drawn about Autonomy, Functionality and Interface. Also other aspects were mentioned about webtool preferences which were not part of the three factors.

High autonomy is preferred above low autonomy, but guidance from the webtool is preferred as well. This resulted in highest preference for Autonomy 2, i.e. freedom with some guidance. For Usefulness, only one YHP did not reject low autonomy. For ease of use there were only two YHPs regarding low autonomy as a serious option. Often autonomy was the first preference criteria, listing all scenarios with low autonomy at the bottom before proceeding with further ordering. YHPs who regarded low autonomy as an option would still like to see an overview at the end. The main reason for high autonomy was the overview of VanWiechen scheme. The overview allowed faster working and was necessary as the YHPs needed to see the whole picture of the child's development. Between high autonomy and compromised autonomy (high autonomy with guidance), all YHPs preferred the extra guidance. Some mentioned the guidance as important, others more as convenient/not troublesome.

A good interface is preferred above a bad interface.

During the interviews YHPs clearly recognised the concept of flow or sequence and regarded it important. Western reading style (left to right, top to bottom) was found best. The order was to be "physician data entry" top left, followed by "child file entry" second and "child medical data" was positioned after this, usually on the right. Below and (left of) the middle was first the VanWiechen scheme and then the results (thermometer and graph) on the right side.

Alignment was mentioned less, although some scenarios with Interface 1 were called messy or chaotic and some with Interface 2 as clear/simple/ordered (which could relate to alignment).

The concept of different font types was mentioned by one person. This could be because there were too little and too few font differences.

The YHPs could easily sort out the "good" Interface 2 from the "bad" Interface 1, and preferred "good" interfaces in all situations. Sometimes Interface 1 gained a positive remark about being orderly or decent, which was not intended. This happened most of the time where the graph and thermometer were placed on both sides of the VanWiechen scheme. This was intended as out of sequence, but interpreted as more or less symmetrical.

Added functionality (help, action and information) is appreciated. Appreciation ranged from "could be useful" to "very much needed". Not everyone found all three functions equally important, but they were mentioned as adding value by different YHPs. Action was appreciated by seven YHPs and help by eight. Background information about the VanWiechen items was mentioned by five YHPs. The background information was already available through a book or should have been known anyway.

In general, scenarios were rated similar for Usefulness and Ease of Use. Scenarios doing well on Usefulness also do well on Ease of Use.

11 Analysis

Several other comments were made. Two YHPs appreciated visual clickable buttons (like the thermometer). Two YHPs mentioned the idea of a startscreen to enter physician data before proceeding to further data entry. Forcing this at the start made sure it was not forgotten. Two YHPs mentioned scrolling as navigation method in an interface as negative. Two YHPs mentioned the use of keyboard for navigation, like TAB.

12 Conclusions of Research Phase I

Research Phase I found 7 themes resulting in 3 important factors, Autonomy, Functionality and Interface. From these three, Autonomy had the clearest impact for both Usefulness and Ease of Use. The other factors were important too, with Functionality second and Interface least important. Functionality had an increased influence for Ease of Use, while Interface had a decreased influence. This makes sense since the extra Functionality which was delivered also contained a Help button, which would make learning and operating easier. A clean and ordered interface on the other hand would contribute to more effective working and prevent YHPs forgetting steps.

The quantitative and qualitative part confirmed each other.

Autonomy is very important for YHPs. Working with the overview of the VanWiechen scheme is required for faster working and to have a total picture of the development of the child. The reactions from the YHPs also confirm the literature about the relationship between physicians and IT. It is important to give the physician freedom to operate and to make decisions without limitations, confirming the work of Anderson [Anderson 1997]. All physicians rejected the Autonomy 1 where the webtool decided what should be done. Also the focus on usefulness over ease of use discovered by Chau and Hu [Chau & Hu 2002] was seen in the argumentation of the YHPs. The motivation for Ease of Use was more about what helped getting the task done correctly instead of what made the webtool simple and easy.

Functionality was also important, though less than Autonomy. The YHPs prefer the inclusion of the extra functions. Some YHPs were very enthusiastic about the extra functions while others mentioned they probably did not need it, but it wasn't in the way either. Not all functions were appreciated equally, where sometimes a YHP thought only one of the three functions useful. In the literature search this factor was mentioned often and the reactions of the YHPs confirm this. Extra functionality is either useful or at least not in the way. Whether this holds for large amounts of extra functions or if that would become bothersome or complex needs to be researched. For this webtool with limited functions the extra functions are useful. The results cannot be translated directly to other literature since functionality as a factor in general literature conveys all functionality of the system. The main functionality of the webtool, the D-screening with the thermometer and D-diagram, is evaluated in Research Phase II.

The YHPs classified the “good” interfaces as ordered, simple, clean and clear. The “bad” interfaces were related to chaotic and messy and would result in more mistakes as the lack of flow would make YHPs forget certain steps. A logical order of objects in the interface will lead to easier and better usage of the webtool. This confirms the literature used to vary interfaces [Ngo 2003] [Parush 2005]. The difference in fonts was not recognized often, perhaps due to the small difference in appearance it made. Though it may seem obvious that YHPs choose the “good” interface, it shows that the concept matters to the YHPs as they clearly recognized the variations in the scenarios with flow and alignment. The development of webtools should follow these principles. A good interface becomes less a vague idea about what looks nice and more a concrete design measure.

For Usefulness YHPs had a similar preference but for Ease of Use there was more variation. It ranged from more independent to more dependant YHPs. Some YHPs regarded the flexibility and freedom of high autonomy with little extra help functions as easy. The preferred

Autonomy 2, with Autonomy 3 as a good alternative. Functionality 2 was preferred over Functionality 1, but only because its buttons were not in the way and thus were convenient extras. They did not think them really necessary. They were YHPs who thought that independence and flexibility generates more ease. Other YHPs finds that assistance and support or guidance gives more ease. They favour lower Autonomy with high Functionality. These difference could stem from differences in computer self efficacy [Igbaria and Iivari 1995], although none of the YHPs showed a negative attitude towards computer use. The question format from Autonomy 1 was not perceived as useful, but they would make use easy. They listed Autonomy higher than other YHPs in their preference for Ease of Use. Still Autonomy 2 was most of these times still at the top. The extra functions from Functionality 2 were more important and they favoured Interface 2 equal all the YHPs. There were also some YHPs in between these extremes. For general IT this could be translated in customization options which allow the physician to add or remove help functions. Even something like the question format from Autonomy 1 could become optional. However this was beyond the resources for the development of the webtool and one single webtool would be developed for all YHPs.

The optimal webtool would be Autonomy 2, Functionality 2 and Interface 2. This combination was optimal for Usefulness. For Ease of Use this would be a compromise of the wishes of both types of YHPs. It has flexibility to freely operate the webtool, but with some extra help and guidance giving both kinds of YHPs what they find easy in use. The extra functions from Functionality 2 are not hindering any YHPs and help the ones who might need it. The same holds for the guidance of Autonomy 2. The red-lining for missing entries and yellow lighting of items won't hinder any YHP. Also for Ease of Use was A2F2I2 the most preferred scenario, which indicates that this is a good combination to provide a webtool with high Usefulness and Ease of Use.

Together with other comments from the interview this knowledge was used to form a list of recommendations in chapter 13. All these recommendations except "No scrolling" and "Use of keyboard/TAB to navigate" were implemented in the final webtool.

13 Recommendations of Research Phase I

The analysis from chapter 11 and the conclusions from chapter 12 were translated into recommendations for the developer of the webtool. The developer of the webtool had produced a prototype. Some of these recommendations were already present in the prototype, others had to be build in. Some recommendations could not be implemented (the last three in the list below). The application of these recommendations is presented in Appendix E.

Prioritised from high to low:

- Autonomy high with guidance (Autonomy 2)
- Data from positioned from top left in the order physician- child file-medical data (Interface 2)
- Presence of action function top right corner (Functionality 2)
- Presence of help function in top right corner (Functionality 2)
- Thermometer and graph bottom right (Interface 2)
- Support through red lining when values are missing (Autonomy 2)
- Support through colouring requested items in VanWiechen field (Autonomy 2)
- Thermometer, graph, help and action need to be visual clickable buttons/icons.
- Presence background information VanWiechen scheme (Functionality 2)
- No scrolling
- Use of keyboard/TAB to navigate
- Separate starting screen

Example of how the webtool would look like with all recommendations (except scrolling):

The screenshot shows the TNO webtool interface in Internet Explorer. The page is titled 'TNO webtool - Windows Internet Explorer' and displays several forms and tables. At the top, there are buttons for 'Actie' (Action) and 'Help'. The interface includes sections for 'Algemeen' (General), 'CB-Consult', 'Kind Achtergrond' (Child Background), and 'Metingen' (Measurements).

Algemeen:

Naam CB Arts:	Test
Meetdatum:	26-05-2010

CB-Consult:

Kindnummer:	2222
Meetmoment:	24 Maanden

Kind Achtergrond:

Kindnummer:	2222
Lokatie:	Gouda Noord
Geslacht:	jongen
Geboortedatum:	07-10-2009
etniciteit:	allochtoon
Hoogst genoten opleiding vader / moeder:	Universiteit
Erfelijke belasting:	Geen van bovenstaande
Leeftijd moeder bij bevalling (in jaren):	24
Meerling:	Nee
Apgarscore 5 minuten:	3

Metingen:

A. Fijne motoriek:

	1 mnd	2 mnd	3 mnd	6 mnd	9 mnd	12 mnd	15 mnd	1,5 jaar	2 jaar
1. Ogen fixeren	+								
2. Volgt met ogen en hoofd 30° 30'		+							
3. Handen af en toe open			+						
4. Kijkt naar eigen handen (M)				+					
5. Speelt met handen middenvoor					+				
6. Pakt in rugligging voorwerp binnen bereik						+			
7. Pakt blokje over							+		
8. Houdt blokje vast, pakt er nog een in andere hand							-	+	
9. Speelt met beide voeten (M)						-	+		
10. Pakt propje met duim en wijsvinger								+	+
11. Doet blokje inv uit doos								+	+
12. Speelt geven en nemen (M)								+	
13. Stapt 2 blokjes									+
14. Gaat op onderzoek uit (M)									+
15. Stapt 3 blokjes									+
16. Doet anderen na (M)									+

B. Communicatie:

13 Recommendations of Research Phase I

40. Begrijpt spelopdrachjes (M)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Zegt zinnen van 2 woorden (M)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Wijst 6 lichaamdeelen aan bij pop (M)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Grove motoriek						
51. Beweegt armen evenveel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. Beweegt benen evenveel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Blijft hangen bij optellen onder de oksels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. Reacties bij optrekken tot zit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Heft kin even van onderlaag	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Heft in buikligging hoofd tot 45°	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Kijkt rond met 90° gehouden hoofd	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. Benen gebogen of trappelen bij verticaal zwaaien	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Rollt zich om van rug naar buik en omgekeerd (M)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Kan hoofd goed ophouden in zit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. Zit op billen met gestrekte benen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Zit stabiel los	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. Kruip vooruit, buik op de grond (M)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64. Trekt zich op tot staan (M)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. Kruip vooruit, buik vrij van de grond (M)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. Loopt langs (M)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
67. Loopt los / loopt goed los / loopt soepel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
68. Gooit bal zonder om te vallen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
69. Raspt vanuit hurkzit iets op	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70. Loopt goed los.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Uitkomsten						
JOI:	<input type="text"/> <input type="button" value="X"/>					
						<input checked="" type="checkbox"/> D-screening 
						<input type="checkbox"/> Diagram 

Research Phase II: Webtool evaluation

14 Introduction Research Phase II

The conclusion and recommendations from Research Phase I are focused on the development of the webtool itself. Research Phase II studied at the actual usefulness and how well the webtool supported the YHPs in the *D*-screening. The second research phase wanted to answer whether the webtool supported the execution of the *D*-screening (project) and how these two together influenced the work of the physicians. A well-built webtool may provide good support for performing the *D*-screening. But if the *D*-screening and working with the webtool don't support the tasks and working process then it would become a hindrance. The research question is stated as:

- 1) *Does the webtool support the tasks and working process of the youth healthcare physician?*

In paragraph 1.3 several sub questions are listed in order to answer this research question.

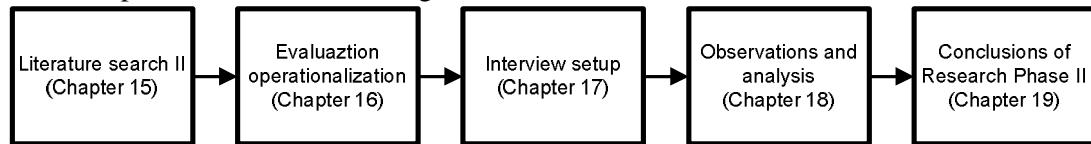
- *2.1) What are the tasks of the youth healthcare physician and what does the working process look like?*
- *2.2) How can support be evaluated?*
- *2.3) What are barriers or enhancements for a good fit?*

Plan of action

The research question of phase II was answered in the form of an evaluation. Through an interview the YHPs were asked what they thought about the webtool, its usefulness and ease of use and if it supported or obstructed their work. First a literature search was performed to look for evaluation frameworks or methods. After this a structure was developed which was formed by theory and more concrete questions. The structure was translated into questions for the interview. The interview was set up as a questionnaire, since some YHPs were not available for face-to-face contact. The interview results were analyzed qualitative, because the sample size was too small for quantitative analysis. The analysis resulted in several conclusions.

Structure

Research phase II has the following structure.



15 Literature search II

To determine important elements for evaluation of the webtool fit within the working process a literature search was performed. Both Web of Science and Scopus were used to search for online articles.

The search terms used were a combination of:

- Task
- Process
- Information technology
- Fit

When looking for the interaction between IT and processes the main concept was task-technology fit (TTF). TTF attempts to explain user performance by several factors which describe the interaction between user/process and the IT. Goodhue and Thompson [Goodhue & Thompson 1995] describe eight final factors with Goodhue developing this later into twelve validated factors [Goodhue 1998]. Most factors are mergers of different dimensions from the original model which started out with 21 dimensions. The eight factors model covers almost all aspects of the twelve factor model, which divided some original factors.

8 Final TTF Factors	16 Original TTF Dimensions (After poor questions dropped)	Cronbach's Alpha
Quality	Currency of the data Right data is maintained Right level of detail	.84
Locatability	Locatability Meaning of data is easy to find out	.75
Authorization	Authorization for access to data	.60
Compatibility	Data compatibility	.70
Ease of Use/Training	Ease of Use Training	.74
Production Timeliness	Production Timeliness	.69
Systems Reliability	Systems Reliability	.71
Relationship With Users	IS understanding of business IS interest and dedication Responsiveness Delivering agreed-upon solutions Technical and business planning assistance	.88

For the evaluation of a healthcare information system Willis used the eight factor version which contains the same factors [Willis 2009]. In table 4 the different factors are explained.

Table 3: TTF factors

Data Quality	The currency of the data, maintenance of the correct data and the appropriate level of detail
Locatability	The ease with which data is located and with which the meaning of the data can be discovered
Data Authorization	The degree with which individuals are appropriately authorized to access the data required for the task
Compatibility	The possibility of interaction with other systems
Ease of Use & Training	User perception on how easy it is to use the system and whether the training was sufficient.
Production Timeliness	The perceived response time for reports and other requested information
System Reliability	Reliability of the system, like uptime and stability

IT Relations	IT department's understanding of business, interest and user support. IT department's responsiveness, delivery of agreed-upon solutions, and technical and unit planning support.
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These eight factors point out aspects for evaluation of the webtool. The factor authorization was left out of the evaluation, since all users had full access to all functionality. TTF claims that neither the task nor the technology alone, but a good combination and interaction lead to good performance. For the webtool these seven factors needed to be translated into questions.

Yusof proposed a framework for the evaluation of health information systems [Yusof 2006]. Table 5 lists the different areas for evaluation with examples of measures. This table is used to complement for missing aspects in the interview. Organisation aspects (structure and environment) are beyond the scope of this research and are not evaluated.

Table 4: IT Evaluation Framework

Technology			Human		Organisation		Net Benefits
System Quality	Information Quality	Service Quality	System Use	User Satisfaction	Structure	Environment	
Ease of use Ease of learning Response time Usefulness Availability Reliability Flexibility Access to technical support Security	Completeness Accuracy Legibility Timeliness Availability Relevancy Consistency Reliability Data entry methods Quality	Quick responsiveness Assurance Empathy Follow up service	Level of use (frequency, duration) Attitude Expectations/belief Knowledge/expertise Acceptance Resistance/reluctance Training	Perceived usefulness User satisfaction	Nature Culture Planning Strategy Management Autonomy Communication Leadership Top management support Medical sponsorship	Financing Source Government Politics Localization Competition Inter-organisational relationship Population served Communication	Direct benefits Job effects Efficiency Effectiveness Error reduction Communication Clinical outcomes Cost

16 Evaluation operationalization

In the previous chapter two ingredients were found for the evaluation of the webtool and its effect on the process of the YHPs; Task-Technology Fit and an evaluation framework. The articles posed general factors which needed to be transformed into an interview tailored to the webtool and the mindset of the YHPs. The interview can be found in appendix I.

The questions were structured by two perspectives to ensure all relevant topics were discussed concerning the fit between the webtool and the working process; a process perspective and a webtool perspective. The interview was divided into three parts. The first part would relate to the process perspective. The second part would relate to the webtool perspective. The third part would be formed by other questions which did not fit in the first or the second perspective.

Next to this evaluation TNO initiated a focus group session to evaluate the project experience of the YHPs in general. Some aspects were already on the agenda of this focus group and were not included in this interview.

16.1 Process perspective

The first perspective was on the process of the YHP and how the webtool supports the process. The process of the YHP has been described in chapter 2. The six step abstraction of the process (observation, registration, interpretation, choosing next step, communication, performing next step) was used to structure the first questions by asking how the webtool supported each step.

First the model of these six steps was explained briefly to the YHP. After this for each step the same question was asked.

- *Does the webtool support step X?*
- *Comment/Elaborate?*
- *In what way is this (the support) expressed? For example is the step made easier, can it be performed quicker, more accurate, less errors or more uniform/according to protocol?*

The first question, “*Does the webtool support step X?*”, is a general question and gives the YHP room to react from their experiences. The third question tries to help the YHP to formulate their experience according to elements of the evaluation framework (table 5 in chapter 16). Uniformity or data according to protocol was not mentioned in the evaluation framework, but is an important aspect in healthcare. Work is formalized and professionalised through the use of protocols. Working in similar fashion means the other YHPs understand your documentation and everyone acts on in the same professional way. The webtool could result in better adherence to protocols or work and document in a uniform way. At the end of each process step a statement was presented.

- *The webtool supports step X.*

One could choose from a 5 point Likert scale, with the options:

0 Totally disagrees 0 Disagrees 0 Neither agrees or disagrees 0 agree 0 Totally agrees.

The mid point was “Neutral” at first, but this could either mean “no opinion” or “in between”. The last option was chosen, to force an answer. This still left the possibility of the webtool having no effect or several positive and negative points. This made it unclear whether it was in the middle versus having plenty of good points balanced out with equal amount of bad points. However the previous questions and remarks would show which would have been the case.

16.2 Webtool perspective

The second perspective was the webtool itself. This shifted the focus back to the IT to make sure all the aspects of the webtool were discussed. It started with a more general question which was directly related to the second research question. It also was a more general question to start with instead of beginning with the first object of the webtool. The second part started with the question whether working with the webtool fitted well into the YHPs' normal working, or if it obstructed their normal work.

Chapter 4 discussed the different basic function the webtool needed to perform. Through the development and implemented recommendations from chapter 13, the webtool contained the following objects:

- Physician administration – Entry field registration of YHPs name and current date
- Child file – Entry field used for opening the file of the child through a registration number and the type of consultation (9 months, 14 months or 2 years)
- Child background – Entry field for extra information about the child and parents used for input of the *D*-screening
- VanWiechen scheme – Data entry field of the developmental test outcomes
- JOI – Entry field for impression of the YHP prior of thermometer use (to test the difference in decision making for TNO project)
- *D*-screening thermometer – The tool presented by the TNO project to improve development
- Decision button – Entry field for the final decision, after the use of thermometer.
- *D*-score graph – A tool used when a child returned for extra consultation, presenting development of the child as a curve through time.
- PDF-function – A button presenting both thermometer and graph in a pdf-file
- Help function – A button presenting information about how to use the webtool and protocol for applying the *D*-screening.
- Action function – A button which presented the protocol for actions to be taken given the outcome of the thermometer and impression of the YHP.

Each of these objects could have a positive or negative effect on the working process of the YHP. Each object had the same basic questions:

- *Is it clear what is expected?*
- *Is it clear how this should be done?*
- *Did this have a positive effect on your work?*
- *Did this have a negative effect on your work?*
- *Any remarks, issues, tips?*

These questions were asked to inquire whether the general use was clear and if the object was experienced as a positive or negative effect on their work. Whether it was clear and understood what and how it should be done relates to the locatability of the TTF factors. These questions are simple and often overlooked, since developers deem the meaning and operation of objects obvious. For some objects these questions were more relevant than others. The "Child file" function, which required a child registration number and a consultation type selection to open a file, was a very basic object with a simple function and use. It was expected to have no positive effect on the working process of the YHP and no negative effect, except for taking a bit extra time. Though no problems were expected, it was asked just in case. Perhaps some side effect like being more conscious of mind steps or aspects of the child could take effect.

For several objects additional specific questions were asked. About the thermometer and *D*-diagram was asked how the YHP used it and what the YHP thought of the information these two functions delivered. These two were the main functions of the *D*-screening and were questioned more elaborate, also in communication towards the parents. The *D*-diagram was only to be used during a second consult, so the YHP might not have experienced it.

Help and Action were also asked different questions because they were not part of the steps of the *D*-screening and thus not needed, but optional. For Help and Action was asked how often it was used and whether it was useful. For Help was also asked if the help was sufficient or whether they required more support or training. This related to “Training” from the evaluation framework and “IS support and training” from the TTF factors.

16.3 Other questions

Some general questions were asked in the final part, which did not follow the two perspective approach well. Since it was an evaluation in response to the design of the webtool in Research Phase I three questions were asked about Usefulness and Ease of Use.

The questions were presented as statements with again a 5 point Likert scale, with the options: *0 Totally disagrees 0 Disagrees 0 Neither agrees or disagrees 0 agree 0 Totally agrees*.

The first statement was:

- *The webtool is easy to use.*

The second statement was:

- *The webtool is useful and improves working with the D-screening.*

The third statement was:

- *The D-screening is useful and improves the work of the physician.*

The difference between the second and third statement was important. The webtool could be build very well, but offer little usefulness because the *D*-screening was useless. Or the other way around, that the *D*-screening was very promising, but webtool prevented the physicians from putting it to good use. After each statement an explanation of their answer was required.

After these statements one more question was asked about how the YHPs see the webtool in future use. At that time they did not use computers in their primary process. But this was going to change in the near future. Data entry for a lot of objects in the webtool would then be standard for the Digital Record Youth Healthcare program, which uses the VanWiechen scheme setup as well. This would eliminate a lot of actions necessary to use the webtool (the thermometer could be implemented in the Digital Record and require only the click of a button, since all other data is already present). This would change the balance between benefits and effort.

They were asked whether they would use the webtool daily in the new (Digital Record) situation. Whether they saw added value in the webtool. If so, what was this added value. If not, what were barriers?

Several questions remained. Data quality, compatibility, production timeliness and system reliability of the TTF factors remained unanswered. Though compatibility with an electronic child registration was mentioned at the end, the concept of compatibility with other systems in general was not discussed. The evaluation framework also offered more measures than currently asked. Response time or production timeliness are similar concepts. They are technical features of the webtool and how well it performs. System reliability was a similar factor in that regard. They were not asked specifically, since there is limited room for questions. If there were any issues with uptime or reaction time of the webtool, it would probably be mentioned. Another important question was about the effort or time needed to use

16 Evaluation operationalization

the *D*-screening and webtool, but this was also to be asked during the focus group session of TNO. At the end there was room for remarks and reactions which the YHP could not have expressed in the previous questions.

17 Interview setup II

17.1 Method

The experience of the YHPs with the webtool was evaluated through a face to face interview. A questionnaire version was send towards the YHPs who were not available for interviewing (see appendix I). The face to face interview had to be administered in 45 minutes.

17.2 Pilot Interview

To practise the interview and test it for duration a pilot interview was administered to a non-YHP. Though this proved useful for practise and a duration check, it did not provide good feedback of the questions. The non-YHP had no experience with the webtool therefore no serious reactions could be given. During the first interview some questions appeared to be unnecessary. An example was that for each object in the webtool the question was asked whether it was clear and understood what the object was (for) and how to use it. For entering names and dates this turned out to be a repetitive silly question.

The first interview also took 1,5 hours, double the time intended. For these reasons some questions for several objects (like data entry and other simple functions) were reduced to:

- Was this object clear?
- Any remarks, issues, tips?

This would allow the YHP to talk about problems occurring in working with a certain object, but also to work through the objects faster if there was nothing to it.

17.3 Sample

For the evaluation of the webtool and the fit with the process all YHPs from the experimental group were to be interviewed. They had been using the webtool in their regular consults. There were five YHPs working on the project at that time. From these YHPs, two were not available for an interview. They were sent the written questionnaire, but did not respond. The three remaining YHPs were all interviewed.

Between research phase I and research phase II some participants in the experimental group of TNO had changed, resulting in a different group. One of the interviewed YHPs also participated in Research Phase I. The other two were not tested on their opinion about Autonomy, Functionality and Interface. Differences in attitude towards the webtool between Research Phase I and Research Phase II could therefore also be attributed to a change in population.

Also the two new YHPs worked relatively short on the project compared to the other three YHPs, who had participated since the start of the project. The webtool was operational for approximately five months, but these had joined the project half way. During the interview the new YHPs sometimes expressed that they had been working too short to give a good answer. The absence of two of the most experienced webtool users in the evaluation was not favourable.

18 Observations and analysis

Three YHPs participated in the evaluation. They were interviewed individually. Their responses are listed in appendix J. The YHPs were very cooperative in the interview. Even though it lasted longer than planned, they were motivated to help in the evaluation.

The webtool was easily incorporated into their consult. They performed their regular tasks and then entered the data into the webtool together with the parents and discussed the results. The webtool fitted well literally.

The YHPs found the use of the webtool to take little extra time, though this was subjective as one mentioned 5 minutes and another 15 minutes. Some YHPs noted that it took double the time, but none labelled that as a serious problem. This was probably due to the extra time, two subsequent sessions instead of one, planned for webtool use during the project. They hoped for at least extra time if the webtool would be used in the future, though a full second session was not needed.

18.1 Process perspective evaluation

In part one of the interview the effect of the webtool on the process was evaluated. The YHPs agreed on the six step model of their working process. Below we present the effect on that process as noted by the YHPs.

1) Observation and measurement of development

Statement	“The webtool supports the observation and measurement of the development of the child”		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Neither agrees or disagrees	Neither agrees or disagrees	Neither agrees or disagrees
Comment	The webtool does not change VanWiechen items.	Webtool is similar as regular dossier.	More focus on required items, but not really extra helpful.

The YHPs found that the webtool had no effect on their observation and testing of the children. The VanWiechen items were not different in the webtool and the way the tests were done or observed was the same. This was expected and it was also a good thing that no negative effect was mentioned.

2) Registration or data entry

Statement	“The webtool supports the registration/data entry of the measurements of the development of the child”		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Disagrees	Neither agrees or disagrees	Agrees
Comment	Yellow lighting prevents registering other items. Costs extra time. No subtlety in answers (no M or remarks possible).	Does not cost a lot of extra effort.	Same as dossier, but likes computer use more and readable for everyone.

The webtool had a mixed effect on the second step, registration and data entry of the tests. The yellow lighting of the required fields had a negative effect on data entry since only the yellow items were done. Other items, for example if the child could do more than expected,

were not filled in. The yellow lighting was part of the Autonomy 2, flexibility in webtool use with guidance on what to do. The yellow lighting was perceived as useful in research phase I, but turned out to have a negative effect on the correct data entry.

The webtool also enforced correct measurement notation according to protocol. Using the regular dossier YHPs sometimes deviate in notation because they think it gives a better representation of the situation (for example +/- instead of strict -). The paper dossier also has room for remarks, which allow registration of more nuances and information about the child, his mood and development. The uniform entry was perceived as both a positive effect (more according to protocol) and a negative effect (no room for more accurate information).

The use of digital data also prevented bad handwriting (which is common for physicians) and loss of records.

3) Interpretation of the measurements

Statement	“The webtool supports the interpretation and assessment of the measurements”		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Disagrees	Agrees	Neither agrees or disagrees
Comment	Dossier gives same information. Thermometer is slightly helpful, but not trustworthy yet. Screening gives chance for developmental problems in the future, but if there is nothing wrong at the moment what can you do.	Webtool confirms your own interpretation. Background information like heredity taint does result in higher greens, but no problems as of yet.	Worked too short with webtool. Up till now every thermometer was green, so difficult to judge its effect.

This was the primary goal of the D-screening, delivering a thermometer which would help in judging the situation of the child. The YHPs had different opinions about the support for interpretation.

The first YHP thought the webtool did not support interpretation. The regular dossier provided information about the development, which already allowed the YHP to assess the development. Because the D-screening was not yet proven, the YHP could not trust the outcomes completely. When the opinion of the thermometer differed from the YHP, the thermometer was wrong. If the reliability and accuracy of the D-screening was proven, it would support the interpretation. The thermometer also presented a chance for developmental disorder in the future. When there was nothing wrong at the moment, what could be done with a child with a high risk. These issues made the webtool less useful.

The second YHP thought the webtool supported the interpretation. The thermometer was seen as a confirmation of her own assessment. The YHP also mentioned that the webtool makes one more conscious of the results.

The reluctance towards the benefits of the webtool for the interpretation was not expected. The thermometer was seen as support as long as it agreed with the YHP. When it disagreed, the thermometer was at fault.

4) Choosing the next step

Statement	“The webtool supports in choosing the next step”		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Agrees	Neither agrees or disagrees	Disagrees
Comment	More standardization/uniformity. Also more conscious about	Decision making with the D-	Sometimes a next step necessary while

	choices.	screening uses the regular protocols.	thermometer was green. Webtool does not tell you what to do.
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According to the development of the child there are different steps which can be taken. In most cases the child is doing well or well enough that no further action is needed. In some cases a next step is taken, which ranges from an extra consult to direct referral to a specialist. The YHPs experience different support from the webtool in choosing the next step.

The use of the webtool made the first YHP more conscious of the choices and observations made, because they were asked to enter this explicitly into the webtool. The webtool also included a protocol of what to do in certain situations. Though it was already known by the YHP, it was also available through the Help and Action button as well as explained during the training given by TNO. The YHP stated that a good thing about screening in general was standardization, which leads to formalization and uniformity. It would have been nice if the thermometer also directly displayed what the protocol suggested considering the outcome.

The second YHP found that the webtool did not support the selection of the next step. The protocols were already present and known, thus the webtool did not add anything positive or negative. This YHP neither agreed or disagreed with the statement.

The third YHP found the webtool unsupportive because sometimes the thermometer gave a green result, which suggests no further action, while the YHP thought there was a problem and choose for further steps. The webtool did not choose the next step for the YHPs, it only gave some support by making the YHPs more conscious about their decision process and providing the protocol.

5) Communication with parents

Statement	“The webtool supports the communication towards the parents”		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Agrees	Totally agrees	Neither agrees or disagrees
Comment	Clear message through visual outcomes of thermometer. Troublesome if you have worries but thermometer is green.	Parents like the webtool and it is more convincing.	If YHP and webtool give same outcome it helps, if they give a different outcome it's obstructive.

The thermometer was also presented to the parents. They had to agree to the experiment of TNO and expected to see the outcome.

All YHPs were positive about the effect of the webtool on the communication, but one also had some negative experiences.

The first YHP agreed that the webtool supported the communication about the development towards the parents. Independent of the outcome, it was used to show where the child was in the population (higher green meant there were brighter kids, but that the child was doing very well). It was used to ease concerned parents and helped to convince them that it is going well. The YHP also mentioned it was a bit troublesome if the thermometer was green and you had to explain to parents that you still had some worries. Overall parents responded well to the visual representation of the development of their child.

The second YHP even noticed that parents were fond of the thermometer. The thermometer was more convincing and it would help to get parents to take action when the development was not going well. While the first YHP would use the webtool to ease the parents, the second would use it to urge the parents.

The third YHP was mildly positive because the webtool was helpful when the thermometer and YHP agreed. But if the YHP had worries and the thermometer showed green, it took more effort and time to explain that further action was needed.

6) Performing next step

Statement	“The webtool supports the execution of the next step”		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Neither agrees or disagrees	Agrees	Neither agrees or disagrees
Comment	Sometimes the diagram is useful and sometimes not.	Not yet experienced a second consult, but would imagine the (visual) diagram to be helpful.	Worked only shortly with webtool. Used diagram once, was nothing special to see so it helped parents to see it was going ok.

If the thermometer showed yellow or orange or if the YHP had general concern a second consult was planned. During this consult the YHP could use the *D*-diagram next to the thermometer to review the situation. Also a validated questionnaire for development, the Ages and Stages Questionnaire [ASQ 2010], was given to the parents to look closer at the development of the child. The second consult was there to get a more thorough assessment of the development, without labelling or diagnosing it as problematic.

The first YHP found the webtool both supportive and unsupportive, depending on the *D*-diagram. The *D*-diagram, which was the main element added, had to be seen prior to the consult to know whether it was useful and supported the story of the YHP.

The second YHP did not perform a second consult, but expected the diagram to be useful in a similar fashion as the thermometer. It was visual information about the development suitable for parents.

The third YHP would not show the diagram often to parents, only if it were really convincing or motivational. The YHP had one case in which the diagram was used. The diagram was nothing spectacular and was used to comfort the parents that the situation wasn't so bad. It was also mentioned that the YHP had used the webtool only shortly, which was also a reason for neither agreeing or disagreeing with the supportive nature of the webtool on this step.

The support generated by the webtool for the next step is much more limited compared to the first consult as the thermometer was more useful than the diagram in communication.

18.2 Webtool perspective evaluation

The second part of the evaluation discussed the positive or negative experience with the webtool based on its objects.

The general use of the webtool was clear. The purpose of the different objects was understood and the YHPs were able to perform their tasks. The webtool posed little problems or issues with the data entry.

Physician administration, Child file and logging in were very straightforward. They had neither a positive or a negative effect on the working process.

Child background was a bit more complicated. The YHPs realised it was an ingredient for the *D*-screening. This made them more conscious of the importance of background information and its impact on development. But one field, hereditary taint, was sometimes problematic. Only limited general options were available from which the YHP had to choose, which forced an irrelevant taint to have negative effect on the screening outcome. The field did not provide all the appropriate options.

The JOI, the entry field for the impression of the YHP, and the Decision entry field made the YHPs also more conscious of their interpretation of the situation and their own reasoning.

These objects posed no serious negative or positive effect, except for more consciousness of the impact of background information and the decision process.

The questions about the thermometer confirmed the results from the process perspective. The first YHP also noted that it was sometimes unclear what colour the thermometer meant when the line was between two colours. The outcome in text could remedy this.

The *D*-diagram was the other form of output of the webtool. The first and second YHP had not used it in practise and the third YHP only in 2 cases. The first YHP had looked at a diagram and found the curve zigzagging too much, which was caused by the child having a bad day and thus performing badly on the VanWiechen items at that point. Other times the curve wasn't very abnormal, which caused it to show nothing. The diagrams were only to be used when it supported their communication. However the YHPs found very few to be useful. The first YHP also questioned the fairness of picking only the diagrams which support your opinion or story.

The last objects were the extra functions Help and Action. Help and Action button were both part of Functionality 2 from Research Phase I. None of the YHPs had needed any of these support buttons, though they were clearly mentioned as important in Research Phase I. They had looked into the content once out of curiosity, but not necessity. The second YHP had not even noticed the presence of the Action button.

The first YHP liked the concept of the Action button, but the implementation was bad. The social map and web links to specialists or institutions gave websites about the main office in another part of the country instead of a concrete address for referral in the neighbourhood. It was also mentioned that development of a child was more about looking at each child individually then trying to box them into protocols. The YHPs found the training given sufficient and did not have the need for more support.

There were some complications. For example the second YHP mentioned that only VanWiechen items for up to 2 years were present in the webtool. The third YHP mentioned the inability to change the child's number. Though these issues should be solved, it did not influence the experience of the users greatly as they were minor complications which happened rarely.

However there were some structural issues. The webtool sometimes reacted slowly to data entry in the VanWiechen scheme. This could be fixed by using a different browser, but this option was not used on the youth healthcare systems. Another problem was that the entire webtool did not react well during the afternoon. The cause was unknown, though it didn't seem to be depending on the webtool design itself. It could have been the database from TNO behind the webtool or a busy internet connection at the side of youth healthcare. The first YHP had trouble using the calendar and needed to click backwards per month for every child's birthday. Complications like this slowed or sometimes even prevented the use of the webtool. This reduced the reliability of the webtool, but was not experienced as strong negative point during the project. If the webtool was to be continued these issues needed to be solved.

18.3 Usefulness, Ease of Use and future use

The final part consisted of three statements and a question about use in the future.

Statement	<i>"The webtool is easy to use."</i>		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Agrees	Agrees	Agrees

Comment	Graphic display is clear.	Obvious operation. Only basic functions available for what needed to be done.	No problems, easy to use.
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The YHPs found the webtool easy to use. The webtool contained very simple functions. It was easy to operate because there was clearly one way to use objects. The YHPs also emphasised the graphic/visual layout as contributing to the ease of use. Some minor issues like the lack of tab-function use or slow response of the VanWiechen scheme were mentioned as improvement points.

Statement	<i>"The webtool is useful and improves working with the D-screening."</i>		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Agrees	Totally agrees	Agrees
Comment	The webtool offers the <i>D</i> -screening while keeping the complicated calculations in the background.	The visualization of development towards parents really supports the <i>D</i> -screening. All the functions to perform the <i>D</i> -screening are present.	By entering development data you receive an outcome, which give more insight in development and background influence of the child.

The webtool had all the functions to perform the *D*-screening and little to nothing extra to complicate it. The first YHP also mentioned the benefits of only having to deal with the data entry and thermometer output without worrying about the black box doing the calculations. Also the ability to visualize the outcome for the parents was mentioned again as a positive aspect. The webtool fitted well for performing the *D*-screening.

Statement	<i>"The D-screening is useful and improves the work of the physician."</i>		
YHP	YHP 1	YHP 2	YHP 3
Opinion	Neither agrees or disagrees	Disagrees	Disagrees
Comment	Sceptical about the outcome.	Did not influence decisions.	Up till now the webtool has not lead to different decisions, so no improvement.

The purpose of the webtool and its functions were to assist the YHP in his or her task of monitoring development. The first YHP had a sceptical attitude towards the reliability and accuracy of the tool. The webtool had not pointed out every child who needed attention and the webtool had also raised the alarm when there was nothing problematic at that time to steer on. The other two YHPs disagreed with the usefulness of the *D*-screening. It had not changed their decisions about the development of the children, which should have been its main effect. The YHPs did not have enough trust in the outcome of the thermometer to really let it influence their practise.

In regard to possible use of the webtool the YHPs were reluctant. The first YHP would use the webtool once the authority of the screening was proven. The main barrier at this time for this YHP was that the information was based on only three different ages which resulted in an outcome based on very few moments. The second YHP said it would be used when the YHP was in doubt and the thermometer could function as a second opinion. It would not be used on a regular basis. The third YHP also thought that a quick look at the thermometer would be done to see if nothing was wrong. If it the outcome would be yellow it would alert the YHP to pay close attention. The overall usefulness was perceived as marginal.

The final question was whether there were any remarks. One YHP pointed out the importance of evaluation. It gave the YHP the idea that they, the user, actually mattered and were taken

18 Observations and analysis

seriously. Another YHP said to have enjoyed using the webtool and working with the computer. Both the YHPs and the parents had a positive attitude towards the webtool.

19 Conclusions of Research Phase II

With a two-perspective approach, process-based and webtool-based, the support was evaluated. Important factors were taken from the Task-Technology-Fit theory [Goodhue & Thompson 1995] and the Evaluation Framework for IT [Yusof 2006]. This resulted in a triple part interview with questions related to the impact on the process steps, the evaluation of each object in the webtool and a few general questions about overall ease of use and usefulness.

The webtool supported the tasks related to the execution of the *D*-screening. The webtool was easy to use because of its simplicity in layout and simplicity in meaning. The webtool looked visually clean and ordered, with not too many objects on the screen. The buttons and entry fields themselves were also very basic, with each icon having a clear meaning. This confirms the literature and results from Research Phase I, with Interface as an important variable. It also emphasises the importance of well designed icons and buttons, which was also researched by Passini [Passini 2008]. The YHPs confirm that a recognizable icon leads to good use.

The ease of use of the webtool was therefore as intended, with Interface as the contributing factor. The extra functionality in the form of a Help button and Action button appeared unnecessary. They were not used, which can also be viewed as a good thing. The training the YHPs had received was sufficient. This could mean the webtool should have been build without Help and Action button. This may only be the case in a very simple webtool. Even if they were not used these functions would at least be comforting to have available for the YHPs. It does indicate that the focus (time and effort) in development of a webtool should be on main functionality and not too much on these extra functions. The user experience is mainly determined by the main functions he or she uses.

There were some design flaws or technical problems. These should be solved if YHPs keep using the webtool. The priority should be on structural problems, like slow reaction time or calendar issues, which frustrate the user on a regular basis. Though these problems were not appreciated by the YHPs, their main concern was that the *D*-screening was not useful. This confirms that physicians focus on usefulness instead of ease of use [Chau & Hu 2002].

The *D*-screening itself was only partially useful to the YHPs. The main aspect of the *D*-screening, the thermometer, had not led to different decisions. Most of the time the thermometer was green and confirmed the physician. This confirmation was experienced as positive. But it also happened that the YHP and the thermometer disagreed, which resulted in doubt about the accuracy of the *D*-screening. YHPs need to be able to trust their instruments. The perceived quality of information was an obstacle in the *D*-screening use. In the evaluation framework Information Quality was one of the three technological factors [Yusof 2006]. Egea and Gonzalez [Egea and Gonzalez 2010] formulated a TAM model for the adoption of a digital healthcare record system, which used trust and integrity of information as main new components. In this study the lack of trust in the information of the thermometer was the main negative point of the *D*-screening. The YHPs remained sceptical about its usefulness until the authority was proven.

The webtool was perceived as supporting communication towards the parent. However most YHPs had experienced situations where the thermometer gave a different outcome then the YHPs' opinion. Explaining this discrepancy to parents took more time and effort.

Still there were two main benefits of the webtool. Because the webtool was often used together with the parents, it involved the parents into the process of the YHP and improved

the interaction. Parents enjoyed being involved in the development of their child. Also because the webtool visualized this development parents gained more feeling and understanding of what the results meant. The outcome of the VanWiechen testing and communication from the YHP was more clear with the picture of the thermometer. YHPs used this to ease parents or convince them to take action. Visualization and involvement both contribute to better healthcare service and design of future webtools should take this into account.

A minor result which was caused by different functions in the webtool was increased consciousness. Confronting the user with his own process and the information which is used within that process makes the user more aware of what was done on a routine basis. This effect probably occurs mainly once at the beginning. After extensive use the webtool would become routine as well. Functions could be designed to trigger this effect on a regular basis by for example questioning the decision process of the YHP.

The main conclusion is that usefulness is the main contributing factor to webtool success for YHPs. Several articles have already concluded this [Davis 1989] [Spil 2004] [Chau & Hu 2002]. This study supports this claim with a practical example. The YHPs assessed the webtool on usefulness and found the D-screening unreliable but the webtool in general supportive in the communication towards parents.

Post Research

20 Discussion

The research and conclusions require some side notes to gain a good understanding of the results. In paragraph 20.1 several remarks are made about the limitations on the outcomes of this study. In paragraph 20.2 several other findings are presented for which the study was not designed, but are worth mentioning.

20.1 Limitations

Accuracy of variables

The variables in Research Phase I were either new or adapted. Usefulness and Ease of Use both have six validated items in TAM [Davis 1989]. This study had to bring that down to one description for each. This may have influenced the measurement of the YHPs' opinions, though other conclusions are not expected.

The three factors were developed in this study. Autonomy (or prescriptiveness) of the webtool was represented by VanWiechen items in table overview or table overview with support or question setup. This variation could be seen as different information presentation instead of increasing/limiting user autonomy. Functionality only covered the extra functionality. And if the extra functionality happened to be something other than Help or Action it might have led to other results. Interface was most singular in its meaning, but in this study it consisted of a few principles. There are many more. As such it is important to review the results in relation to the operationalization of these factors.

The evaluation in Research Phase II was structured by a new developed framework of process and webtool perspective. The literature was used to fill in the gaps and substantiate the evaluation aspects. However the statements in interview were not validated. Since the statements and questions were very straightforward they are expected to have asked the YHPs about their experience correctly.

Sample size

Another important aspect is the number of people in the samples. In Research Phase I this was 10. In Research Phase II this was only 3. That gives a very small basis to draw robust conclusions. On one side we see that YHPs are very alike, both in Research Phase I and II. This would mean the results are to some extent generalizable. The results of this study should be verified in a larger setting.

Ordering method

The ordering of the scenarios was left free to the YHPs. Since there were twelve scenarios there could have been bias in what aspect or factor was ordered first. Other methods, for example pair wise comparison, could have led to other outcomes. However the result of the ordering was checked with the YHP, allowing final changes in the order thus countering early bias partly.

Scenario development

The scenarios used in Research Phase I are all different combinations of Autonomy, Functionality and Interface. Since the design of the different combinations was also a creative

process, the scenarios were not all perfectly displaying the factors. For example a chaotic placement of clumped up buttons was regarded once as usefully grouped up. Because this could have lead to a minor different ordering of one scenario for one YHP it is not to be expected to influence the results.

Also the difference in fonts was very small and wasn't noticed during the testing. Only one YHP mentioned during the interview that it was forgotten to change all fonts to the same type (not knowing this was on purpose). Perhaps the variation in font should have been left out or made more explicit to really say something about its effect.

YHPs changing opinion

In Research Phase II we discovered that the YHPs found the extra Help and Action button (Functionality 2) useless, while this was a recommendation in Phase I. The difference in the importance of Functionality 2 over Functionality 1 between these two research phases may have been caused by several possible reasons. One is that there are two different groups of YHPs in the two phases. This change in sample could have caused a change in opinion. Another reason could be that the YHPs felt reluctant to criticize the extra work or give socially expected answers. Since some YHPs were more direct but still found the extra functions useful in Phase I this doesn't seem to be the case. However it could also depend on the ability of the YHPs to express or even know what they really need. The elicitation of requirements in any IT development is important. In Research Phase I this happened through paper scenarios. The evaluation in Research Phase II followed actual use of the webtool. This study demonstrates the need for developers to realize that even with a very good method and experienced people, the user could still pose a limiting factor. Sometimes the user cannot tell what he or she really wants. Using IT in daily practice with real people, data and decisions will really point out what was useful and what is missing.

It is important that development does not stop once the requirements are gathered or the IT is delivered, but continues when the user actually experiences the webtool. Evaluating and adapting IT is the key to delivering usefulness and ease of use.

Solution selection

Multidimensional Unfolding creates multiple solutions (or graphs) of the same data. The choices made in generating these solutions and the selection of the best solution have an impact on the outcome. Discarding solutions which violated the limitations posed no problem. However the selection criteria for the remaining solutions is more disputable. In this study this was based on the lowest *I*-index, because this gives the most spread out displays and other indicators were stable. However one could also look for the solution with least *stress* or the highest R^2 or best interpretable graph or another criteria. Fortunately most solutions were very similar in results. For example for Usefulness the R^2 values for Autonomy, Functionality and Interface showed similar numbers in all possible solutions. This means that although the conclusions about the influences of the three factors are solid, the R^2 values should be regarded as indications instead of definite figures. It also shows a weakness of Multidimensional Unfolding, being more an explorative tool than a testing tool. The qualitative part of the interview in Research Phase I confirms the outcomes, thus maintaining their credibility. Further research for a standardized solution generation and selection process is recommended.

Misunderstood D-screening

The *D*-screening appeared not as useful as intended during the evaluation. However YHPs could have misinterpreted the meaning of the thermometer. The thermometer is based on statistics which give a chance of the negative developmental situation in the future. The

impression of the YHP is about the child sitting in front of him or her now. If the YHP and the thermometer had different opinions, this was experienced as the thermometer being at fault. However a child can be developing perfectly well at the moment while also having a great statistical chance to be at a special school at a later age. Because the relationship of the YHP and the thermometer was experienced as being opposing instead of complementing each other, the usefulness of the *D*-screening could be perceived as much lower. The *D*-screening, as intended by TNO, might have gained a higher appreciation of the YHPs if the meaning was better understood. This means that the *D*-screening in itself should not yet be written off and it also shows the importance of good training/explanation of webtool functionality.

20.2 Unintended findings

Positive attitude YHP

First thing to note was that the YHPs within the TNO project react positive towards improvements in quality of care, like more correct referrals. They embraced the idea of a project looking to improve their work. They also enjoyed participating with the project. The use of the computer was experienced as positive as well as working with a graphic webtool. During the testing with scenarios several YHPs said to find the idea of working with paper examples interesting and fun. The lesson to be learned is that YHPs are keen on improving their work. They are not computer anxious and they are open towards discussing or evaluating different aspects of IT. Developers should use the opportunity to involve physicians in the development process.

Ease of Use affecting Usefulness

Ease of Use and Usefulness were two concepts from the TAM [Davis 1989]. The article also mentions that Ease of Use could be an independent variable for Usefulness. During the interviews with the YHPs we noted that they had a hard time keeping Ease of Use and Usefulness apart. They mentioned that when something is easy to use it improves its usefulness and allows you to work faster. Perhaps the YHPs referred and thereby confirmed this relationship. It could also explain why the preference order is very similar for Ease of Use and Usefulness.

Promoting Unfolding

Multidimensional Unfolding is an underused method because in the past it had its limitations. It still is a more explorative method which does not give hard figures. However it is an interesting technique which allows the visualization of the attitude of different people to different objects. In this research it was useful, for it required a small population and allowed measurement of the opinions of the YHPs through preferences instead of rating all the scenarios on several different items. It worked well with the paper scenarios and the YHPs responded positively. The outcome of unfolding is a visual representation of the preferences. Interpretation can prove difficult as there is no hard test value at the end of the method. But it proved its value in this study and is recommended to other researchers as an alternative worth considering.

Usefulness for the user

Usefulness perceived by the user counts. Not the intended usefulness of either developer or researcher. Too often IT is made, with the best intentions, based on characteristics and functions designed by the developer. The developer tries to realize what he thinks is best and then asks the user if he agrees. In Research Phase I several webtools were generated and the YHP could choose which option worked best. In Research Phase II it turned out it takes more

than just designing the webtool to provide what the YHPs needed. Through evaluation, after a few months of use, it became apparent that the *D*-screening had limited effect and that the webtool contained unused functions.

Also the need for more correct referral came from outside the YHPs. If the YHP themselves considered the need for more correct referrals they perhaps came with a different solution or at least considered the *D*-screening as complementing them. The YHPs thought their own assessment was sufficient and deemed the webtool at fault for saying otherwise.

The focus needs to be on the user. By letting the user come forth with a problem and experiencing the IT instead of asking and suggesting for improvements, real requirements will become apparent.

21 Final Conclusions

The *D*-screening provided less usefulness than intended. It did not help in the decisions made by the YHPs. It did help in the communication towards the parents. It also realized more consciousness of the YHPs' own activities and thought processes.

Research Phase I showed that Autonomy, Functionality and Interface are three important factors to YHPs when it comes to usefulness and ease of use of webtools. Autonomy influenced their opinion most with Functionality second and Interface last.

Research Phase II discovered that the extra functionality was not needed. Also the yellow lighting of suggested items proved counterproductive. This shows the difference between evaluating user opinion based on paper scenarios in the development phase and user opinion based on actual experience. This emphasizes the need for continued evaluation and development of IT after implementation.

Interface design had contributed to an easy to use webtool. According to the YHPs this was caused by its clear layout and simple understandable objects. This confirms the applicability of interface literature [Ngo 2003], with flow as the most apparent aspect while others are less significant.

The three factors were tested with a small sample size. For better validity of these outcomes another study with a larger sample size is suggested. This study focused on only three, but there are many more for further research.

Autonomy was most important. Current literature describes autonomy on an abstract level [Wiklund-Engblom 2009] or formulates it as a concept like perceived threat to power [Bhattacherjee 2007]. This study has tried to make autonomy a concrete design aspect of the webtool. YHPs want to work with the total table-overview of the VanWiechen scheme. Working with a question format, which is currently used in some Digital Record Systems, is not favoured. YHPs want to have the overview and freedom in decisions and actions. For Digital Records (which use the VanWiechen scheme) there also needs to be room for remarks and nuance about the child and especially the quality of child development. Also the option to register attitude (whether the child sleeps, is anxious or shy) which was available in the regular paper dossiers needs to be available in a digital version.

Though the outcome of the *D*-screening was not as useful as intended in the project of TNO, several aspects of the webtool suggest further use.

First it is important to establish the meaning of the *D*-screening, to determine its possible uses. It warns the YHP of higher risks for a child to end up in special education. As such it is not a second opinion or diagnosis tool, but simply presents the odds for future developmental issues. If the *D*-screening would become standard use in the future it needs to fulfil the role of warning the YHP. The YHP needs to understand that this assessment of the *D*-screening may differ from the current situation. Using a different icon (perhaps not a thermometer, but a Y-crossroad) which represents the future aspect and displaying text with each outcome explaining the results could help the YHP to interpret the *D*-screening and its use(fullness) correctly.

Another lesson from the webtool was that it increased consciousness for some steps or information. A future application of the *D*-screening could probe questions checking the YHP in his decision, for example if the YHP took all background variables into account when the child had a heredity taint. Text can also contain hints about what should be done according to

21 Final Conclusions

protocol. These tips and questions will help the YHPs to become conscious about their actions.

The usefulness of the webtool was mostly in its support in the communication with the parents. Offering visual explanation of the development of the child should be implemented in future software. In general YHPs discovered that the involvement of the parents into the care process was appreciated by the parents. IT can support this interaction with presentations of tests and results which are easy to understand. IT in youth healthcare therefore needs to be developed for both YHP and parents.

These three recommendations, better explanation of the concept and meaning, increasing consciousness and developing for (communication with) parents, are also applicable to other applications. The Digital Record Program is a platform for many applications and these three recommendations should be used in their development.

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Appendix

Appendix A: Generation and selection of Multidimensional Unfolding solutions

Appendix B: Explanation of Multidimensional Unfolding analysis methods

Appendix C: Scenario material

Appendix D: Interview I text

Appendix E: Interview I form

Appendix F: Interview I response

Appendix G: Application recommendations I

Appendix H: Results literature search for factors

Appendix I: Interview II text and form

Appendix J: Interview II response

A Generation and selection of Multidimensional Unfolding solutions

Multidimensional Unfolding allows several different displays of the same preferences/data, called solutions. Different displays are made through changing parameters and initial start position. Choosing a good graph or solution is dependent on two aspects. First the solution has to be close to the original data, being accurate on what was observed. Second the picture has to be interpretable. This can be done by changing parameters. A picture can be molded into something very easy to interpret, but at the loss of accuracy. To make sure the graph is accurate enough and also decent for interpretation there are limitations for favorable output values.

Table 5: Limitations for solution to ensure accuracy

Output value	Limitation values
Stress-1	<0.3
$V(\delta)$:	0.4-0.6
$V(\hat{d})$:	0.4-0.6
$V(d)$:	0.4-0.6 $V(d) \& V(\hat{d})$ need to be similar
I index	As close as possible to 0
D -index ($d(e(f))$ en $d(e(d))$)	Close to 0 or positive

Other output values which give an indication are:

- VAF (Variance Accounted For),
- Rho (% of preference in the solution that is the same as in the data),
- $Firsts$ (how many people have their first preference the closest).

The analysis uses two versions of each solution. A unrestricted version, where the scenarios and YHPs position themselves according to preference, and a restricted version, where the position of the scenarios is not only determined by the YHPs but also dictated (restricted) by the factors.

Restriction can be applied in different ways, so called transformations. There are three transformation possibilities: numerical, secondary and primary. They determine the gravity of the restriction on the position of the scenarios in the solution.

1. Numerical is the strongest restriction. Numerical restriction is used when the meaning of a factor variation is equal for all scenarios of that variation. For example autonomy should be viewed as similar by the YHP in A3F1I1 and A3F2I2, because Autonomy is equal in all scenarios with A3. This also prohibits correlation. Scenarios with A3 cannot be seen as different dependent of Interface or Functionality combinations. In the graph this results in scenarios of the same variation to be positioned in a line. For numerical transformation, the interval between each factor variation is also equal. For example the distance between scenarios with Autonomy 1 and 2 is equal to 2 and 3 in the graph.
2. Secondary transformations also force equal meaning for the factor variations, but the interval between the variations may differ. For example since Autonomy 2 and 3 are more similar, the distance between Autonomy 2 and 3 would probably be smaller than Autonomy 2 to 1. Numerical and secondary transformations are the same for

Functionality and Interface, because they have only two variations and thus one distance.

3. Primary transformations are the lightest restriction, forcing variations to be in the same range, but not necessarily on the same line. The position of scenarios is free, as long as they are on the same side with similar variations (for example all 1 on right side) and not beyond any scenario with another variation (for example all 2 on left side).

The variations of Functionality were always done in a similar fashion. They either had the extra functions or no extra functions. For Autonomy this was the same. For example when the items of the VanWiechen were asked in a question in Autonomy 1, the format was always similar. This would suggest either numerical or secondary transformations, because the execution of a variation in different scenarios is the same which should give similar meaning. Interface was changed by a few standard principles, but with more creativity to make sure not all scenarios were obviously a composition of good or bad interface. This allows more room for a primary transformation. We choose primary transformation because for all variations we do not know the effect of combining it with other variations. Interface may matter more when there are more functions available (Functionality 2). Or extra guidance could remedy a chaotic overview (Autonomy 2). Therefore we allow the option of correlation and choose primary.

Making different solutions was done with variation on the following parameters:

- Starting solution: triangle, spearman, correspondence, ross-cliff, centroid and random
- The positioning within a solution is done through iteration. Beginning with different starting positions results in different solutions.

- Omega: 1, 5, 20

This is a parameter which penalizes different preferences to become alike. Unfolding allows the preference of 1,2,3 and 4 to be distanced as 1,30,100 and 1000 as well 1,1.01,1.02 and 1.021. Omega prevents certain degeneracy and result in more spread in positioning, which improves interpretation.

- Transformations: Primary.
- Restricted and Unrestricted.

Usefulness solution generation and selection

With six starting positions, three omega values and two transformations this resulted in 18 possible settings. The variations with output values above the limitations (see table 3) were discarded. An unrestricted version was made for the remaining variations. These were also filtered on limitations. This resulted in solutions sets (a restricted and an unrestricted solution) which were both accurate (within the limitations). This resulted in two sets, a spearman start with omega 1 and a triangle start with omega 1. Of these the combination triangle start with omega 1 was chosen (see figure 2). The spearman solution had most of the YHPs located on the same spot, which was also indicated by a higher I-index (2,7 compared to 1,8 for triangle). The triangle start solution also had 8 firsts compared to 6 for spearman. The spearman solution had a higher average R^2 with 0,81 and the triangle 0,77. This meant that the positioning of the scenarios in the spearman solution fitted better to the factors than in the triangle solution. However since the interpretability of the triangle solution was better and the difference in R^2 only minor, we chose for the triangle start, omega 1 solution.

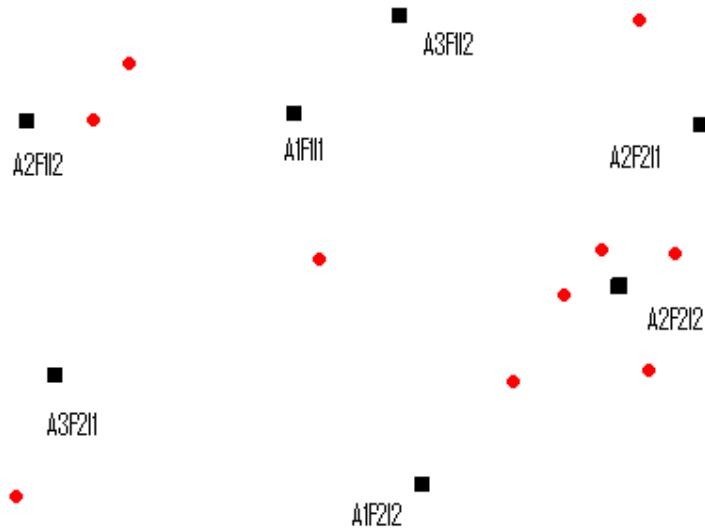
Ease of Use solution generation and selection

The limitations from table 3 where used to filter restricted variation and remaining unrestricted variation. Six solutions remained, with one spearman start, one random start, one

triangle start and three correspondence starts. The random start had a relative high I-index, which corresponded to clustered scenarios and all YHPs in a similar line, making it unsuitable for interpretation. The triangle solution also had very clustered positioning for the scenarios. Spearman start had this to a lesser extent, looking which turned out similar to a reversed triangle solution. This made correspondence the best solution. The correspondence solution had omega 1, 5 and 20 all within the limitations of table 3. Omega did not affect the graph significantly, so omega 20 was selected for having the lowest I-index. The solution correspondence start with omega 20 was selected.

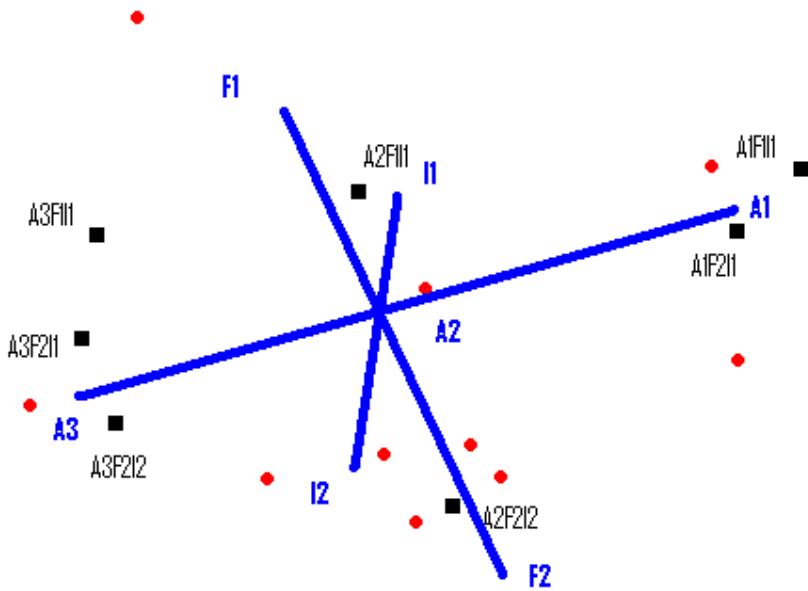
B Explanation of Multidimensional Unfolding analysis methods

To answer whether a factor has impact, two methods were used. The first method is to make two solutions. One solution places the YHPs and the scenarios in a graph. The distances between the different YHPs and the different scenarios corresponds to their preferences. The solution will place a YHP close to his most preferred scenario and far from his least preferred scenario. This also means that a scenario is positioned close to YHPs who prefer the scenario and further from YHPs who do not prefer the scenario. The positioning for objects within the graph is free and only dependent of the preference with other objects. This is called an unrestricted solution.



Example 1 Unrestricted Solution (black dot = scenario, red dot = YHP)

The second solution also places the YHPs and scenarios in graph, but “restricts” the scenarios to the factors. Again YHPs are positioned close to preferred scenarios and scenarios close to their YHPs. But the scenarios also try to position themselves according to the factors. This is called a restricted solution.



Example 2 Restricted solution (black dot = scenario, red dot = YHP)

The YHPs and scenarios are free in positioning within an unrestricted graph, but restricted to the factors in the restricted graph. In a restricted solution the factors force themselves upon the scenarios.

The first method looks at the difference between these two solutions. If the transition from an unrestricted solution to a restricted solution allows the scenarios and YHPs to stay at their correct distances (little compromise to the original data) this means the factors fit very naturally. This is the case when the scenarios are already positioned according those factors. All objects want to correspond well to the distances of the original data, but because there are multiple objects and preferences (and factor restrictions) their position is a compromise. The difference between distances in the compromised solution and the original distances (i.e. preferences) is called *stress*. Large stress means the distances in the solution do not correspond to the original preferences of the YHPs.

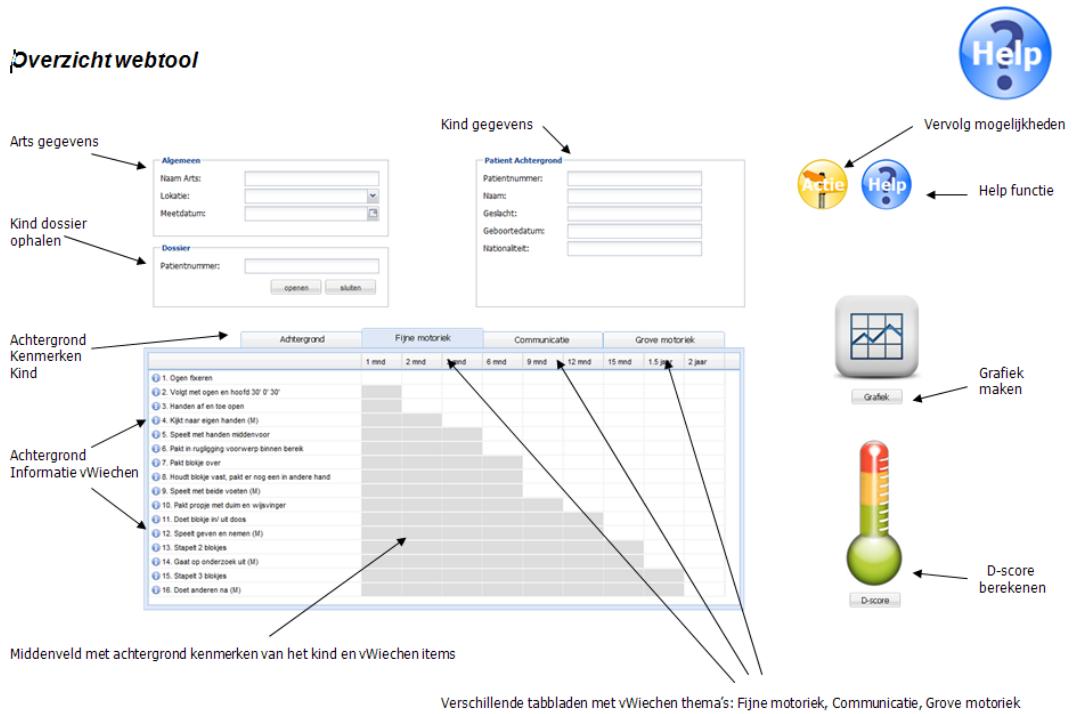
If the transition from unrestricted (solution without factors) to restricted (solution with factors) has little increase in stress (the scenarios are still at the right distances), then the factors explain variance in positioning well. If the factors explains the variance in positioning then they explain the variance in preferences of the YHPs and have a significant impact. The first method determines the impact of the factors by transitioning from unrestricted to restricted and establish the stress increase.

The second method to determine the effect of a factor is to calculate a coefficient of determination, R^2 , for each factor. When this is done in a unrestricted setting (the three factors don't influence the solution space/ the three factors are not added as restrictions), R^2 can be used to see how well the scenario preferences follow that factor. High R^2 means that a factor predicts position in the solution and therefore its impact on the preferences is significant. Both methods were applied because they complement each other.

C Scenario material

- C.1 Help functie
- C.2 Actie functie
- C.3 VanWiechen information
- C.4 Scenario Autonomy 1 Functionality 1 Interface 1
- C.5 Scenario Autonomy 1 Functionality 1 Interface 2
- C.6 Scenario Autonomy 1 Functionality 2 Interface 1
- C.7 Scenario Autonomy 1 Functionality 2 Interface 2
- C.8 Scenario Autonomy 2 Functionality 1 Interface 1
- C.9 Scenario Autonomy 2 Functionality 1 Interface 2
- C.10 Scenario Autonomy 2 Functionality 2 Interface 1
- C.11 Scenario Autonomy 2 Functionality 2 Interface 2
- C.12 Scenario Autonomy 3 Functionality 1 Interface 1
- C.13 Scenario Autonomy 3 Functionality 1 Interface 2
- C.14 Scenario Autonomy 3 Functionality 2 Interface 1
- C.15 Scenario Autonomy 3 Functionality 2 Interface 2

C.1 Help functie





Werkwijze

Stap 1: Voer gegevens arts in.

Voordat andere gegevens worden ingevoerd moet de [naam van de arts](#) en [naam van de locatie](#) in worden ingevoerd. Dit is belangrijk om de [gegevens van de kinderen](#) goed op te slaan voor het onderzoek.

Stap 2: Voer gegevens kind in.

De [persoonsgegevens](#) bevinden zich rechts bovenin het scherm. Dit is om het kind op te zoeken in het bestand. Indien het kind nog niet eerder is ingevoerd moet dit worden aangemaakt. Klik hiervoor op de "maak nieuw kind aan" knop.

Stap 3: Vul kenmerken kind in.

De kenmerken bestaan uit 2 onderdelen:

- [Achtergrond kenmerken](#)

De achtergrond kenmerken bevinden zich op linker tabblad van het middenveld. Dit zijn een aantal kenmerken van het kind die éénmalig moeten worden ingevoerd. Deze hebben permanente waarden, zoals duur zwangerschap, kenmerken ouders, etc.

- [Van Wiechenschema](#)

De verschillende items van het Van Wiechenschema zijn terug te vinden onder de drie tabbladen van het middenveld. Door het gewenste veld aan te klikken kan een score worden ingevuld. Zodra de gewenste items zijn ingevoerd, druk op "Opslaan" (rechts onderin het middenveld) om de gegevens te bewaren.

Stap 4: De thermometer

Als alle gegevens zijn ingevoerd kan de thermometer de kans laten zien op een ontwikkelingsachterstand. Let erop dat dit geen diagnose is. Het geeft aan dat (eventueel) het kind extra aandacht verdient en dat (eventueel) een vervolgafspraak gewenst is. De thermometer heeft 3 uitkomstmogelijkheden

- **Groen** : D-screening geeft geen reden aan tot actie. Dat wil niet zeggen dat er geen actie nodig is, blijf altijd zelf de conclusie trekken.
- **Oranje**: Grensgeval, aanbevolen om vervolgafspraak te maken
- **Rood** : Duidelijk aanleiden tot extra aandacht.



Stap 5: Vervolg afspraak en diagram

Indien de thermometer **Oranje** of **Rood** aangeeft is er reden voor een vervolgafspraak. Tijdens deze afspraak kan beter/specifiek/extra geobserveerd worden, waar een ontwikkelingsachterstand zich voordoet. Tijdens deze vervolgafspraak kan een [D-diagram](#) getoond worden. Deze geeft in een curve weer hoe de ontwikkeling van het kind is verlopen over de afgelopen tijd.





C.2 Actie functie

Actie

De resultaten van het ontwikkelingsonderzoek dienen besproken te worden met de ouders. Een positieve score bevestigt de ouders. Een negatieve score kan leiden tot teleurstelling. Er zijn een aantal vervolg stappen mogelijk afhankelijk van de ernst.

In de beslisboom staan de opties weergegeven.

Informeren, adviseren, stimuleren en begeleiden

Bij een aantal ontwikkelingsproblemen is het mogelijk om de ouders te informeren over het bevorderen van ontwikkeling. Ook bij normale ontwikkeling kan adviseren of stimuleren positief zijn. Aspecten hierbij zijn:

- Is de omgang met het kind leeftijdsadequaat?
- Is er (over)stimulatie of juist gebrek aan stimulatie tot echte verwaarlozing?
- Hoe verloopt de hechting?
- Bij elk advies hoort een vervolgafspraak ter evaluatie.

Bieden van extra zorg

Een extra consult bied mogelijkheid tot bredere observatie. Ook kan met de JGZ verpleegkundige afgesproken worden voor een huisbezoek. Belangrijk is weer de interactie tussen ouder en kind.

Consulteren

Bij complexere problemen kan een collega uitkomst bieden. Hierbij kan het gaan om professionals binnen en buiten de JGZ. Belangrijk is om hierbij de ouders te informeren. Indien het kind al bij een arts loopt, stel hier dan het traject/overleg mee af.

Wie/Wat	Contact
Sociale kaart	www.socialekaarten.nl
Stafarts	06-fictief341
JGZ consulteren	9349552

Verwijzen

Bij verwijzing kan op verschillende manieren gebeuren. Een specialist is gebruikelijk indien de oorzaak duidelijk lijkt en op een bepaald gebied ligt. Indien de oorzaak of problematiek nog onduidelijk is, kan men er voor kiezen om door te verwijzen voor algemeen onderzoek.

Voor case management binnen de JGZ kiest men de volgende kanalen.

Wie/Wat	Contact
Stafarts	06-fictief341
Formulier 21: case management	www.jgzformulieren.nl/middenrein/f21
Begeleiding CASE	www.CASEjgz.nl

Voor externe verwijzing kiest men voor de volgende kanalen.

Wie/Wat	Contact
Lijst specialisten	www.igzzuidholland.nl/lijstspecialisten
Huisartsen	www.igzzuidholland.nl/lijsthuisartsen

C.3 VanWiechen information



10 Pakt propje met duim en wijsvinger

(52 weken=12 maanden)

Achtergronden

Ontwikkelingsveld

Neurologisch aspect

Onderzoeksleeftijd

Aanbevolen leeftijd

Spreiding

Onderzoeksmethode

Uitgangspositie kind

Uitvoering onderzoek

Observatie

Beoordeling

Positief

Negatief

Registratie

Fijne motoriek en adaptatie

Ontwikkeling van de coördinatie van het zien, van de hand- en vingermotoriek (grijpfunctie) en het pakken van een voorwerp.

52 weken (12 maanden)

44 - 60 weken

De ouder zit aan een tafel tegenover de onderzoeker. Het kind zit bij de ouder op schoot, recht voor de tafel. De tafel moet zodanig opgeruimd zijn dat het kind niet wordt afgeleid. Het kind moet zo zitten dat het zijn armen vrij kan bewegen en de voorwerpen gemakkelijk kan hanteren.

De onderzoeker legt een propje (gekleurd) papier (doorsnede $\pm 0,5$ cm), vlak voor het kind op tafel. De kleur van het propje moet duidelijk contrasteren met de kleur van het tafelblad. De onderzoeker wijst naar het propje of raakt het aan om de aandacht van het kind erop te vestigen en moedigt het kind aan het te pakken. Beide handen worden apart onderzocht.



Waarschuwing: op deze leeftijd brengen kinderen aldus vastgepakte voorwerpen meestal onmiddellijk naar de mond. Uit hygiënische en veiligheidsoverwegingen zorgt de onderzoeker ervoor dat dit niet kan gebeuren.

De onderzoeker observeert met welke greep het kind het propje pakt, zowel links als rechts.

De volgende manieren van grijpen mogen als positief worden beoordeeld:

'Inferior pincer grasp' (= tussen toppen van duim en eerste of tweede vinger, de hand steunen op de tafel)

'Driepuntsgreep' (=tussen toppen van duim, eerst en tweede vinger, de hand los van de tafel)

'Schaargreep' (= tussen de gestrekte duim en de zijkant van de wijsvinger, de hand los van de tafel)

'Nijptanggreep' (= tussen toppen van gebogen duim en gebogen eerste vinger, de hand los van de tafel)

'Pincetgreep" (= tussen toppen van gestrekte duim en eerste vinger, de hand los van de tafel).



Het kind pakt het propje niet

Of

Het kind wijst alleen maar naar het propje of raakt het eventueel aan met een gestrekte wijsvinger ('pointing' of 'tipping').

+ Bij positieve respons.

- Bij negatieve respons.

Links en rechts apart registeren. 'Pointing'/'tipping' onder 'opmerkingen' noteren.

Overweging

Het zijn vooral de kwalitatieve aspecten van de grijpfunctie die een signaal kunnen zijn van een ontwikkelingsachterstand. Sommige kinderen met een matige motoriek tonen de pincetgreep wel als de wordt uitgelokt, maar vallen in hun spontaan gedrag gauw terug op onrijpere vormen van grijpen. Het verwaarlozen (in functioneel gebruik) van een arm of een hand geld op elke leeftijd als alarmerend (Touwen, 1990)

C.4 Scenario Autonomy 1 Functionality 1 Interface 1

The screenshot shows the Webtool D Screening software interface. At the top, there are tabs for 'Bestand', 'Bewerken', 'Beeld', 'Favorieten', 'Extra', and 'Help'. A 'Grafiek' button is located at the bottom left. On the left side, there is a 'Dossier' section with a 'Patientnummer' input field and 'openen' and 'sluiten' buttons. Below it is an 'Algemeen' section with 'Naam Arts', 'Locatie', and 'Meetdatum' dropdowns. To the right, there is a 'Patient Achtergrond' section with fields for 'Patientnummer', 'Naam', 'Geslacht', 'Geboortedatum', and 'Nationaliteit'. In the center, a box displays the question '39 weken - 9 maanden' followed by '9. Speelt met beide voeten (M)?'. Below the question are buttons for 'Rechts', 'Links', 'Volgende...', and 'Opslaan'. To the left of the question is a thermometer icon with a green base and red top, labeled 'D-score'. At the bottom, there is a status bar showing 'start' and 'Internet Explorer - Z...'.

C.5 Scenario Autonomy 1 Functionality 1 Interface 2

This screenshot shows the same Webtool D Screening software interface as the previous one, but with a different layout. The 'Grafiek' button is now at the top right. The 'Dossier' and 'Patient Achtergrond' sections are on the right side. The 'Algemeen' section is on the left side. The central question box is identical to the one in the first interface. The thermometer icon and 'D-score' button are on the left. A 'Grafiek' button is on the right. The status bar at the bottom shows 'start' and 'Internet Explorer - Z...'. The overall layout is more compact than in interface 1.

C.6 Scenario Autonomy 1 Functionality 2 Interface 1

This screenshot shows the first interface of the Webtool D Screening application. On the left, there are two sections: 'Algemeen' (General) and 'Patient Achtergrond' (Patient Background). The 'Algemeen' section contains fields for 'Naam Arts' (Doctor's Name), 'Lokale' (Location), and 'Meetdatum' (Measurement Date). The 'Patient Achtergrond' section contains fields for 'Patientnummer' (Patient Number), 'Naam' (Name), 'Geslacht' (Gender), 'Geburtsdatum' (Birth Date), and 'Nationaliteit' (Nationality). In the center, a blue-bordered box displays the question '39 weken - 9 maanden' (39 weeks - 9 months) followed by '9. Speelt met beide voeten (M)?' (9. Plays with both feet (M)?). Below the question are buttons for 'Zoeken' (Search), 'Volgende' (Next), 'Opslaan' (Save), 'Rechts:' (Right), and 'Links:' (Left). To the right of the central box are three icons: a thermometer icon labeled 'D-score' (with a green gradient), a graph icon labeled 'Grafiek' (with a blue gradient), and a yellow circle labeled 'Actie'. At the bottom left is a 'Help' button with a question mark icon.

C.7 Scenario Autonomy 1 Functionality 2 Interface 2

This screenshot shows the second interface of the Webtool D Screening application. It has a similar layout to interface 1, with 'Algemeen' and 'Patient Achtergrond' sections on the left. The central question box is identical to interface 1. However, the icons on the right are different: a yellow circle labeled 'Actie' and a blue circle labeled 'Help'. The thermometer and graph icons are also present but have different visual styles compared to interface 1. The 'Help' button at the bottom left is identical to interface 1.

C.8 Scenario Autonomy 2 Functionality 1 Interface 1

Webtool D Screening

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten Webtool D Screening

Patient Achtergrund

Patientnummer:	<input type="text"/>
Naam:	<input type="text"/>
Geslacht:	<input type="text"/>
Geburtsdatum:	<input type="text"/>
Nationaliteit:	<input type="text"/>

Algemeen

Naam Arts:	<input type="text"/>
Lokatie:	<input type="text"/>
Meetdatum:	<input type="text"/>

Dossier

Patientnummer:	<input type="text"/>
<input type="button" value="openen"/> <input type="button" value="sluiten"/>	



Achtergrund	Fijne motoriek	Communicatie	Grove motoriek						
	1 mnd	2 mnd	3 mnd	6 mnd	9 mnd	12 mnd	15 mnd	1.5 jaar	2 jaar
1. Ogen fixeren									
2. Volgt met ogen en hoofd 30° 30'									
3. Handen af en toe open									
4. Kijkt naar eigen handen (M)									
5. Speelt met handen middenvoor									
6. Pakt in rugligging voorwerp binnen bereik									
7. Pakt blokje over									
8. Houdt blokje vast, pakt er nog een in andere hand									
9. Speelt met beide voeten (M)									
10. Pakt propje met duim en wijsvinger									
11. Doet blokje in/ uit doos									
12. Speelt geven en nemen (M)									
13. Stapt 2 blokjes									
14. Gaat op onderzoek uit (M)									
15. Stapt 3 blokjes									
16. Doet anderen na (M)									

start Internet Explorer - 2... 13:59

C.9 Scenario Autonomy 2 Functionality 1 Interface 2

Webtool D Screening

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten Webtool D Screening

Algemeen

Naam Arts:	<input type="text"/>
Lokatie:	<input type="text"/>
Meetdatum:	<input type="text"/>

Dossier

Patientnummer:	<input type="text"/>
<input type="button" value="openen"/> <input type="button" value="sluiten"/>	

Achtergrund	Fijne motoriek	Communicatie	Grove motoriek						
	1 mnd	2 mnd	3 mnd	6 mnd	9 mnd	12 mnd	15 mnd	1.5 jaar	2 jaar
1. Ogen fixeren									
2. Volgt met ogen en hoofd 30° 30'									
3. Handen af en toe open									
4. Kijkt naar eigen handen (M)									
5. Speelt met handen middenvoor									
6. Pakt in rugligging voorwerp binnen bereik									
7. Pakt blokje over									
8. Houdt blokje vast, pakt er nog een in andere hand									
9. Speelt met beide voeten (M)									
10. Pakt propje met duim en wijsvinger									
11. Doet blokje in/ uit doos									
12. Speelt geven en nemen (M)									
13. Stapt 2 blokjes									
14. Gaat op onderzoek uit (M)									
15. Stapt 3 blokjes									
16. Doet anderen na (M)									

start Internet Explorer - 2... 13:59

C.10 Scenario Autonomy 2 Functionality 2 Interface 1

Webtool D Screening

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten Webtool D Screening

Patient Achtergrund

Algemeen

Dossier

Achtergrund Fijne motoriek Communicatie Grove motoriek

Grafiek

Actie Help

D-score

1. Open ogen
2. Volgt met ogen en hoofd 30° 30'
3. Handen af en toe open
4. Kijkt naar eigen handen (M)
5. Speelt met handen middenvoor
6. Pakt in rugligging voorwerp binnen bereik
7. Pakt blokje over
8. Houdt blokje vast, pakt er nog een in andere hand
9. Speelt met beide voeten (M)
10. Pakt propte met duim en wijsvinger
11. Doet blokje nr uit doos
12. Speelt geven en nemen (M)
13. Stapelt 2 blokjes
14. Gaat op onderzoek uit (M)
15. Stapelt 3 blokjes
16. Doet anderen na (M)

C.11 Scenario Autonomy 2 Functionality 2 Interface 2

Webtool D Screening

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten Webtool D Screening

Algemeen

Patient Achtergrund

Achtergrund Fijne motoriek Communicatie Grove motoriek

Grafiek

Actie Help

D-score

1. Open ogen
2. Volgt met ogen en hoofd 30° 30'
3. Handen af en toe open
4. Kijkt naar eigen handen (M)
5. Speelt met handen middenvoor
6. Pakt in rugligging voorwerp binnen bereik
7. Pakt blokje over
8. Houdt blokje vast, pakt er nog een in andere hand
9. Speelt met beide voeten (M)
10. Pakt propte met duim en wijsvinger
11. Doet blokje nr uit doos
12. Speelt geven en nemen (M)
13. Stapelt 2 blokjes
14. Gaat op onderzoek uit (M)
15. Stapelt 3 blokjes
16. Doet anderen na (M)

C.12 Scenario Autonomy 3 Functionality 1 Interface 1

Webtool D Screening

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten Webtool D Screening

Achtergrond Fijne motoriek Communicatie Grove motoriek

	1 mnd	2 mnd	3 mnd	6 mnd	9 mnd	12 mnd	15 mnd	1½ jaar	2 jaar
1. Ogen fixeren									
2. Volgt met ogen en hoefd 30° 30°									
3. Handen af en toe open									
4. Kijkt naar eigen handen (M)									
5. Speelt met handen middenvoor									
6. Pakt in ruilopgave voorwerp binnen bereik									
7. Pakt blokje over									
8. Houwt blikje vast, pakt er nog een in andere hand									
9. Speelt met beide voeten (M)									
10. Pakt propte met duim en wijsvinger									
11. Doeit blokje in uit doos									
12. Speelt geven en nemen (M)									
13. Stapelt 2 blokjes									
14. Gaat op onderzoek uit (M)									
15. Stapelt 3 blokjes									
16. Doet anderen na (M)									

Algemeen

Naam Arts:

Lokatie:

Meetdatum:

Dossier

Patiëntnummer:

Patiënt Achtergrond

Patiëntnummer:

Naam:

Geslacht:

Geboortedatum:

Nationaliteit:

D-score

Start Internet Explorer - Z... 13:59

C.13 Scenario Autonomy 3 Functionality 1 Interface 2

Webtool D Screening

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten Webtool D Screening

Agemeen Naam Arts: <input type="text"/> Locatie: <input type="text"/> Meetdatum: <input type="text"/>	Patient Achtergrund Patiëntennummer: <input type="text"/> Naam: <input type="text"/> Geslacht: <input type="text"/> Geboortedatum: <input type="text"/> Nationaliteit: <input type="text"/>																																																																																																																																																													
Dossier Patiëntennummer: <input type="text"/> <input type="button" value="openen"/> <input type="button" value="sluiten"/>																																																																																																																																																														
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D-score


Grafiek

Internet Explorer - Z... 13:59

C.14 Scenario Autonomy 3 Functionality 2 Interface 1

Webtool D Screening

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten Webtool D Screening

Achtergrund	Fijne motoriek	Communicatie	Grove motoriek
1. Ogen fixeren	1 mnd		
2. Volgt met ogen en hoofd 30° 30°	2 mnd		
3. Handen af en toe open	3 mnd		
4. Kijkt naar eigen handen (M)	6 mnd		
5. Speelt met handen middenvoor	9 mnd		
6. Pakt in rugligging voorwerp binnen bereik	12 mnd		
7. Pakt blokje over	15 mnd		
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13. Stapelt 2 blokjes			
14. Gaat op onderzoek uit (M)			
15. Stapelt 3 blokjes			
16. Doet anderen na (M)			

Algemeen

Naam Arts:

Lokale:

Meetdatum:

Dossier

Patientnummer:

Patient Achtergrund

Patientnummer:

Naam:

Geslacht:

Geburtsdatum:

Nationaleit:

Help

Actie

Grafiek

Internet Explorer - Z... 13:59

C.15 Scenario Autonomy 3 Functionality 2 Interface 2

Webtool D Screening

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten Webtool D Screening

Achtergrund	Fijne motoriek	Communicatie	Grove motoriek
1. Ogen fixeren	1 mnd		
2. Volgt met ogen en hoofd 30° 30°	2 mnd		
3. Handen af en toe open	3 mnd		
4. Kijkt naar eigen handen (M)	6 mnd		
5. Speelt met handen middenvoor	9 mnd		
6. Pakt in rugligging voorwerp binnen bereik	12 mnd		
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Algemeen

Naam Arts:

Lokale:

Meetdatum:

Dossier

Patientnummer:

Patient Achtergrund

Patientnummer:

Naam:

Geslacht:

Geburtsdatum:

Nationaleit:

Help

Actie

Grafiek

D-score

Internet Explorer - Z... 13:59

D Interview I text

Goedemiddag/Hallo/Voorstellen.

Bedankt dat u mee wilt doen aan het TNO onderzoek naar de *D*-screening. En alvast bedankt voor dit gesprek. Ik zal eerst even kort uitleggen wat het TNO onderzoek inhoud en wat mijn rol daarin is. Dan leg ik de webtool uit en hoe mijn vooronderzoek zo in zijn werk gaat. Als u vragen hebt stel ze gerust.

Een belangrijke taak van de JGZ arts is om de ontwikkeling van kinderen te monitoren. Vanuit de Integrale Vroeghulp is de wens uitgesproken dat kinderen met een ontwikkeling achterstand eerder verwezen worden. Omdat juist bij jonge kinderen nog veel gedaan kan worden aan de ontwikkeling.. TNO heeft een onderzoek gedaan waaruit blijkt dat een berekening op de scores van het van Wiechen schema samen met een aantal achtergrondkenmerken van het kind geschikt zijn om ontwikkelingsachterstand te voorspellen op latere leeftijd. Dit wordt de *D*-screening genoemd. TNO wil dit nu gaan testen in de praktijk en gaat ergens in Juni starten met de *D*-screening in de praktijk. Eind mei wordt hierover uitgebreid voorlichting gegeven.

Het werken met de *D*-screening gebeurd doormiddel van een webtool. Dat is een website waarop de gegevens van een kind kunnen worden ingevoerd. Met gegevens wordt gerekend en dat levert de kans van een kind op een ontwikkelingsachterstand op. Dit wordt weergegeven in een thermometer op de website. Kinderen die risico lopen op een ontwikkelingsachterstand (thermometer oranje of rood) worden uitgenodigd voor een vervolgesprek. Vooraf aan dat gesprek wordt een *D*-scorediagram gemaakt, wat de ontwikkeling van een kind in de tijd weergeeft.

Mijn onderdeel hierin is om die webtool zo goed mogelijk te maken. Ik wil bij jullie kijken hoe de beste webtool eruit komt te zien. Ik doe een vooronderzoek waarvan de resultaten terugkomen in de webtool. Zo meteen laat ik 12 mogelijke versies zien van de webtool. Deze zijn nog niet definitief. Daarna leg ik 2 criteria uit en dan moet u ze 2 keer op volgorde leggen, eerst voor het ene criterium, dan voor het andere criterium. Als er vragen zijn of opmerkingen, mag u die gelijk stellen.

Elke versie bestaat uit een aantal onderdelen. Er zijn velden om gegevens in te voeren. Allereerst gegevens van de arts en op welke locatie deze op dat moment is. Daarnaast worden de gegevens van het kind vastgelegd. En er is de mogelijkheid om kinderen op te vragen uit het systeem. In dit veld wordt het van Wiechen schema ingevuld. De items komen overeen met het gebruikelijke formulier. Dan zijn er nog 2 knoppen: 1 voor de thermometer en 1 voor het groeidiagram voor ontwikkeling. De diagram wordt alleen gebruikt bij een vervolgafspraak. Sommige versies hebben extra mogelijkheden. De extra mogelijkheden zijn een blauwe "Help" functie, een gele "Actie" knop en een Informatie knop.

- De Help knop geeft uitleg over de webtool, bijvoorbeeld een overzicht of een werkwijze. Moet dezelfde functie hebben als help in Windows. Deze plaatjes zijn er om een idee te geven, ze zijn niet definitief.
- De "Actie" knop geeft mogelijkheden voor verwijzing zodra blijkt dat er extra stappen nodig zijn. Een voorbeeld ter illustratie... te denken valt aan formulieren, gegevens specialisten, beslisboom etc. Hierin kan bijvoorbeeld het protocol in terug komen.

- Laatste extra mogelijkheid is “Informatie”. Deze geeft achtergrond informatie over een van Wiechen item. Dat kan bekijken worden ter ondersteuning, hoe was het ook al weer, hoe test ik dit etc.

Tot zover duidelijk?

Als we dan de verschillende versies doornemen.

Computer geeft aan welk item/vraag ingevuld moet worden en vraagt daarna het volgende. De webtool geeft aan wat er moet gebeuren.

Computer geeft hint aan wat er gewenst is. Bijvoorbeeld veld vergeten in te vullen of item dat aan de beurt is, of de thermometer knop licht op.

Andere mogelijkheid is dat de computer niks aangeeft, u naveert volledig zelf door de webtool.

De versies verschillen ook in hoe ze eruit zien. Plek van een knop of veld varieert.

De 2 criteria waar u zo meteen op gaat waarderen zijn effectiviteit en gemak. Ik leg ze allebei eerst uit en het is belangrijk om ze uit elkaar te houden.

- Effectiviteit houdt in of de webtool de kwaliteit van uw werk verhoogt. Dat u meer taken juist/correct kan uitvoeren. Voorbeeld: goed en snel gegevens kunnen invoeren.
- Gemak is of de webtool makkelijk te hanteren is. Is de webtool duidelijk, begrijpelijk, makkelijk aan te leren. Kunt u makkelijk in de webtool doen wat u wilt doen.

De bedoeling is nu om de verschillende versies op volgorde te leggen op basis van (alleen) effectiviteit. Meer, juist, correct, beter uw taken kunt uitvoeren.

Volgorde vastleggen.

Dan nu hetzelfde maar dan voor gemak. Begrijpelijk, makkelijk te leren, makkelijk om in de webtool te doen wat u wilt, makkelijk in gebruik.

Volgorde vastleggen.

Dan nog 5 vragen:

Wat vond u goed aan de webtools? Wat sprak u aan?

Wat vond u niet goed?

Wat heeft u gemist (aan functionaliteit)?

Welke webtool heeft u voorkeur?

Op-en aanmerkingen?

Bedankt voor uw tijd. Hebt u nog vragen? Esther is projectleider, dus u kunt met haar altijd contact opnemen.

E Interview I form

Antwoordformulier

Naam:											
Functie:											
Locatie werkzaam:											
Datum:											

Effectiviteit:

Minst1	2	3	4	5	6	7	8	9	10	11	Meest12

Gemak:

Minst1	2	3	4	5	6	7	8	9	10	11	Meest12

Wat vond u goed aan de webtool?

Wat vond u niet goed?

Wat heeft u gemist (aan functionaliteit)?

Welke webtool zou u uitkiezen?

Op- en aanmerkingen?

F Interview I response

During the interviews the scenarios were given a label A to L for the twelve scenarios.

A1F1I1 = A

A3F2I1 = B

A3F1I2 = C

A2F1I1 = D

A1F1I2 = E

A2F2I2 = F

A3F2I2 = G

A2F2I1 = H

A2F1I2 = I

A3F1I1 = J

A1F2I1 = K

A1F2I2 = L

Respondent A

Wat vond u goed aan de webtool?

- Grote thermometer (moet je elke keer aanklikken), grafiek mag iets kleiner.
- Tabbladen is goed, alles in 1 scherm, niet scrollen en niet uitvouwen (+ en – als in Windowsverkenner)

Wat vond u niet goed aan de webtool?

- Starheid in de tool (A1). Best geleid worden maar uiteindelijk beslis ik zelf.

Wat heeft u gemist (aan functionaliteit)?

- Lege velden consult, links en rechts velden bij items
- koppeling EKD+patient nummer, arts, locatie en meetdatum kunnen overgenomen worden (werkt zelf met KD+)

Welke webtool zou u uitkiezen?

F

Op/aanmerkingen?

- A1 vervelend, bepaal zelf wat ik wil beoordelen + overzicht zien, wat een kind daarvoor scoorde.
- bij 10,5 maand zelf willen bepalen of het 9 of 12 maanden consult wordt.
- A2 met voorgesteld veld lijkt op KD+
KD+ ook met rood balkje om missing aan te geven.
- Je wordt geleid bij A2, dus je vergeet niets in te vullen. Je moet je tijd niet besteden naar zoeken of je alles wel hebt gehad, want dat geeft de webtool wel aan.
- A1 niet goed. Als een kind al met de voeten speelt terwijl je bij andere vraag zit, dan moet je dat gelijk kunnen invullen (niet onthouden om later in te vullen)
- overzicht mist bij A1
- Extra dingen niet per sé nodig, ook niet erg maar je pakt er gewoon een boek bij.
- graag “actie” uitprinten en op bureau ipv op pc. Niet gewend om vanuit de pc te werken hierin. Als eenmaal wel gewend om ook deze functies uit pc te halen dan misschien juist heel handig.
- thermometer onderaan is rustiger, grafiek bovenaan.
- F2 niet nodig, maar ook niet afleidend.
- toch wel met hulp dingen, je hoort het te weten, maar zo niet dan is hulp mogelijkheden toch sneller (vWiechen informatie).
- hulp voorkomt fouten, layout maakt daarin minder uit, is meer of het mooi is. Wel liever naam bovenin links zodat als dat klaar is (eenmalig) je het weg hebt in een hoekje.
- layout(goed of slechte) maakt voor fouten niet uit
- verwacht E>A qua gemak
- de functies die gedaan moeten worden moeten apart zijn van de optionele functies
- duidelijk lettertype op prijs gesteld.
- goede kleuren, behalve geel (=niet goed te zien), misschien oranje omdat het bij geel+rood hoort wat de thermometer is.
- grafiek mag wat kleiner, beetje lomp en je gebruikt hem minder
- layout minst belangrijk... niet zo...

Respondent B

Wat vond u goed aan de webtool?

- kaders overzichtelijk, kleurkeuze (stoplichtkleuren), kleur is beter dan zwart/wit
- volgorde arts->patient->vWiechen

Wat vond u niet goed aan de webtool?

Even schakelen van formulier splitsing naar totaal tot 2 jaar
Hulpmiddelen in het midden= rommelig, verspreiden

Wat heeft u gemist (aan functionaliteit)?

Protocol ->actie
Infoknop ->vWiechen achtergrond

Welke webtool zou u uitkiezen?

F of K met rood oplichten van gemiste gegevens en overzicht aan het eind (A1 is wel handeling op handeling dus F beter)

Op/aanmerkingen?

- help altijd handig, om op terug te vallen
- achtergrond vWiechen heel handig
- als los ding A1 goed maar samenvatting zou aan het eind moeten volgen (een overzicht)
- overzichtelijkheid, rechts hulp en buttons
- A1 met overzicht en samenvatting en rood oplichten zou mooie combinatie zijn
- als kind al is ingevoerd, zo min mogelijk velden nodig, weinig administratief werk.
- L wat rommelig. K overzichtelijk (groot vlak)
- arts gegevens links boven (werken van links naar rechts)
- tijd is belangrijkste factor
- opmerkingen als formulier vervalt is als extra nodig
- de 2 toestand kenmerken ontbreken: als kind huilt of niet wilt of slaapt.
- webtool dwingt tot echte + en - (is goed, al wil je zelf wel eens anders)

Respondent C

Wat vond u goed aan de webtool?

- Sociale kaart, ondersteunen naar ouders toe met telefoon en naam
- Thermometer helpt bij twijfelgevallen, als ie rood dan eerder verwijzen
- Grafiek helpt naar ouders

Wat vond u niet goed aan de webtool?

Layout van K, je vergeet help (help zit daar links onderin, terwijl de rest zich rechts bevindt)

Wat heeft u gemist (aan functionaliteit)?

- Opmerkingen kunnen maken (als dossier vervalt)
- Gedragstoestand van het kind meenemen
- Een standaard verwijsbrief zou fijn zijn, maar is al aangekaard bij management (uitgelegd dat dit waarschijnlijk te ver gaat voor webtool).

Welke webtool zou u uitkiezen?

F

Op/aanmerkingen?

- overzicht belangrijk want: verloop van ontwikkeling belangrijk, hoe ervoor, hoe nu.
- sociale kaart bij de hand
- rustige layout is belangrijk/goed
- gegevens moeten boven, vWiechen onder
- 1 scherm voor gegevens of boven naar beneden, niet links naar rechts, dan vergeet je dingen in te vullen
- vWiechen centraal
- actie en help knop echt een pluspunt
- actie inhoud: huisartsen, fysiotherapeut, logopedist, spraak/taal spreekuur, integrale vroeghulp, RNO babylon, audiologisch centrum (kindarts en oogarts gaan via huisarts)
- ouders zijn een hele grote factor in werkelijk verwijzen, ondanks conclusie arts.
- als pc het begeeft of doet het niet of loopt vast, wat dan? Slaat het automatisch gegevens op (is wenselijk). Iemand kunnen bellen?

Respondent D

Wat vond u goed aan de webtool?

- invoerveld overzicht in vergelijking met A1
- Eenvoudige duidelijke knoppen met plaatje (om op te klikken, groot)

Wat vond u niet goed aan de webtool?

- meerdere plekken patient nummer invullen.
- Achtergrond dubbel
- 1 startveld met arts en kind openen, als kind niet bestaat dan kind invullen

Wat heeft u gemist (aan functionaliteit)?

Controle of kasnummer en kind overeen komen door andere kenmerken dan naam. Buiten TNO onderzoek zou naam leidend zijn.

Welke webtool zou u uitkiezen?

F met thermometer rechts met daar rechts van het diagram

Op/aanmerkingen?

- Geen naam invoeren
- items patient achtergrond controleren
- in basis manier van werken A1 of A2 of A3
- A1 minder overzichtelijk, onhandig, minder snel
- Belangrijk om wel eerdere items te zien, maar niet kunnen wijzigen
- Groot veld, veel vakjes, dus A2 beter, zolang je maar ergens kunt invullen
- A1 geen verband te zien met elkaar, item dat je niet bij leeftijd hoort dan gaan zoeken (=veel handelingen)
- flow belangrijk, eerst arts en patient
- Positie thermometer/grafiek: Thermometer boven grafiek (werken van links naar rechts en boven naar beneden), thermometer beneden grafiek (thermometer gebruik je meer dus die onderin rechts)
- informatieknop is handig als het kinddossier komt, nu voor onderzoek niet nodig, doe je dat terwijl je een kind voor je neus hebt? Niet iets ondersteunends naar ouders toe.
- actieknop net als info, als het in dagelijks gebruik/EKD komt
- dingen opnemen wat je kunt gebruiken naar ouder
- thermometer die een advies afgeeft (tekst uit protocol aan ouders, rood: dus bla bla bla...), maar moet genuanceerd, dus misschien mondeling beter.
- extra info moet toegankelijk zijn, maar dat kan voor/na consult dus hoeft niet in de webtool.
- help functie wel handig
- actie verschilt van veel regio's, dus niet per se effectief
- thermometer & grafiek naast elkaar positief
- thermometer op meerdere plekken
- scrollen vervelend, tabbladen beter
- overzicht is makkelijk, met toetsen door het veld heen (tab of pijltjes toetsen)
- A1 meer denkwerk, A2 en A3 zie je wat je hebt ingevuld. Bij A1 ga je met volgorde denken/wennen, waardoor je het denkt te weten => op automatische piloot gaat invullen => fouten maakt omdat het niet goed in je hoofd zit.
- 1 start scherm. Vervolgscherm, geen verleiding om verschillende dingen eerst uit te voeren.

Respondent E

Wat vond u goed aan de webtool?

F rustig, overzichtelijk

A2 handig, hulp middelen, grafiek functie is ook goed, hulpmiddelen > A2. Van hulpmiddelen actie het meest (=nieuw)

Kleur is prima, behalve thermometer, die is wel erg rood (voor ouders)

Wat vond u niet goed aan de webtool?

Thermometer moet vriendelijker (geel tot oranje?)

Wat heeft u gemist (aan functionaliteit)?

Koppeling EKD

Welke webtool zou u uitkiezen?

F

Op/aanmerkingen

-Bepaalde volgorde niet handig

-Afhangelijk van een kind (benen spelen) (A1 niet handig)

-Help knop & verwijsknop belangrijk, stroom diagram niet altijd in je hoofd, omdat je niet vaak verwijst.

-Algemene gegevens boven

-A2 in vWveld handig

-Invulwelden vW & andere 1 blok, moet/hoort bij elkaar

-Je moet het veld zien, gewend aan formulier, geen A1

-Gegevens invullen links

-knoppen hulp, vervolg, thermometer rechts

-anders rommelig, meer tijd

-alles erin +gesorteerd (geordend)

-actie>help

-gaan van één naar andere blok (flow?)

-A1 is meer klikken

-gemak = snel doorheen = logische volgorde

-gemak = hulpstukken

Respondent F

Wat vond u goed aan de webtool?

Logische plaats, logisch werken, gegevens bij elkaar, conclusies ook bij elkaar.

Wat vond u niet goed aan de webtool?

A1 niet goed, minder prettig/effectief.

Gescheiden buttons

Wat heeft u gemist (aan functionaliteit)?

Niet echt iets, moet ook niet teveel worden=te druk, je moet het ook binnen de tijd doen.

Welke webtool zou u uitkiezen?

F

Op/aanmerkingen

- Totaal plaatje beter dan vraag
- hulp is handig
- informatie had niet gehoeven, ken je al
- actie wel handig, even beslisboom voor je neus
- Layout niet super belangrijk (later toch wel), als je moet kiezen dan wel overzichtelijk, maar zou niet schokkend zijn van een slechte layout
- Keuze volgorde: A1 niet, help & actie, A2>A3, layout
- splitsing gegevens links, resultaten rechts
- A1 niet, je koppelt items, bij A1 ondersteunt het “door elkaar denken” niet
- Bij gemak oplichten (A2) prioriteit, actie & help toch ook makkelijk
- eerst eigen gegeven => dossier => andere gegevens
Volgorde belangrijker dan links rechts of rechts links/ boven onder of onder boven.
- gegevens boven, begin je mee
- gegevens of onder elkaar of naast elkaar, niet mix
- volgorde gegevens belangrijk

Respondent G

Wat vond u goed aan de webtool?

- Gele ondersteuning, thermometer & grafiek, rood oplichten
- help, actie knop vooral handig, vW informatie wel eens handig bij twijfel of het kind het wel goed genoeg doet

Wat vond u niet goed?

- Rommelig is niet goed, dingen moeten bij elkaar.

Wat heeft u gemist (aan functionaliteit)?

-

Welke webtoel zou u uitkiezen?

- F

Op- en aanmerkingen?

- liever overzicht
- rare layout als links onderin niks zit (alles naar schuinboven getrokken versie interface)
- gele kleurtjes handig
- A1 geen overzicht, kan je niet naar eerdere items kijken
- actie en help ook makkelijk
- A2 bovenaan
- A1 qua gemak ook niet zo gek
- gemak: kleurtjes -> vragen -> A3
- rode oplichten wel makkelijk
- gegevens boven, mag links en rechts

F beste, resultaat +F2 rechts (flow)

I als tweede (flow> niet I)

Respondent H

Wat vond u goed aan de webtool?

- Informatie vWiechen -> oedereen ter beschikking, maar op CB maar 1 boek
- Geel is handig, verplicht invullen bovenaan, anders blokkeren. Wordt nu ook vergeten.

Wat vond u niet goed

- zo weinig mogelijk handelingen
- zo weinig mogelijk met de muis

Wat heeft u gemist (aan functionaliteit)?

- lege ruimtes ertussen
- prematuren corigeren voor leeftijd

Welke webtool zou u uitkiezen?

F (begint bovenaan, vergeet personalia niet, overzichtelijk)

Op- en aanmerkingen?

- A1 schiet niet op, teveel klikken
- 4 of 4,5 maand consult, lege velden missen
- bij kinddossier wel opmerkingen nodig!
- als je alleen op minnetjes zonder opmerkingen heb je veel gevallen waar eigenlijk niks mee is.
- tab om verder te kunnen
- zo min mogelijk muis
- knoppen overzichtelijk aan de buitenkant (rechts), eind van het consult onderaan
- knoppen moeten niet in het midden
- vW informatie heel prettig
- A2, direct goede lijn door geel is handig
- actie is handig
- arts eerst, dan patient
- A2>A3
- flow zorgt ervoor dat je niks vergeet
- rood oplichten is goed
- geel is makkelijk
- A1 niet makkelijk, schiet niet op
- A2>A3>A1 => F2>F1 =>I2>I1

Respondent I

Wat vond u goed aan de webtool?

- Kleurtjes kolom
- vW informatie belangrijks om te weten of je het goed doet
- grafiek met verloop

Wat vond u niet goed?

- A1 vervelend, meer tijd, onoverzichtelijk, gewend aan A3

Wat heeft u gemist (aan functionaliteit)?

- toestand kind

Welke webtool zou u uitkiezen?

F

Op- en aanmerkingen

- A1 vragen kost meer tijd, iedere keer nieuwe vragen
- informatie hoor je te kunnen doen, maar I-tje staat niet in de weg, bij twijfel wel handig
- thermometer en grafiek links staat ervoor/ niet handig
- gegevens moeten boven
- actie en help niet in de weg, maar hoeft niet per se. vW informatie dan nog het beste
- F en I overzichtelijk
- thermometer en grafiek rechts
- knoppen niet in het midden
- gemak: wel iets meer help functie
- 1 item te gelijk is onoverzichtelijk (geen A1)
- A2 en A3 makkelijker dan A1
- help functies erbij
- help weegt minder zwaar dan volgorde (flow)
- Autonomy2 makkelijker dan Functionaliteit2
- Help en actie toch minder mate, je doet toch in overleg met moeder, actie afhankelijk.

Respondent J

Wat vond u goed aan de webtool?

- Grafiek+thermometer
- Actie, dat iedereen zelfde actie doet na meting.
- Herve vWiechenschema kunnen zien
- Rekening houden met achtergrond kenmerken
- Mooi, rustige kleuren

Wat vond u niet goed?

- Als het een rommelig was, alles overal verspreid staat.
- Ook vervelend als je lang door 5 schermpjes heen moet werken.

Wat heeft u gemist (aan functionaliteit)?

- Plaatje van een kind, ouders kijken vaak mee. Dan is het goed als het vriendelijk is ipv kil. ---
- Maar webtool in principe goed.

Welke webtool zou u uitkiezen?

F

Op- en aanmerkingen

- help meer voor gemak, kost tijd dus niet efficiënt.
- naam arts eerst, dan nummer (dossier)
- A1 onderaan.
- help niet zo voor effectiviteit. Als je vanaf het begin maar goed geleerd/getraind bent.
- Gegevens bovenin
- icoontjes bij elkaar
- thermometer en diagram bij elkaar. Actie en help bij elkaar.
- volgorde algemeen, dossier, achtergrond
- liever orde dan A2>A3
- links naar rechts
- je kunt dingen vergeten door onlogische volgorde.
- Actie knop goed qua efficiëntie
- je moet het hele vWiechenschema in kunnen vullen en beoordelen (geen A1)
- Gemak A1 beter
- Wordt op F2 gesorteerd
- F2=>A1=>I2>I1=>A2=>A3
- Waar je heen wilt gaan met je cursor is mooi, aanklickbaar, ronde vormen (icoontjes)
- Strak, niet rommelig
- Informatie vWiechen items gebruik voor range/spreiding leeftijd
- Naar ouders: Rotterdam had uitroeptekens bij een risico kind, had ook een hartje of sterretje kunnen zijn.
- Webtool professionele omgeving, niet één of ander IQ quizje met popups.

G Application recommendations I

The developer hired by TNO has made a prototype of the webtool. The appliance of the previous recommendations is presented below. Many results are already present in the prototype. These are indicated by PRESENT (I & II). Results that are missing, but it should come in are marked with ADAPTATION (III-VII). Results that are not present, but not be adjusted due to lack of resources or opportunities are identified by NOT PRESENT (VIII to X).

I) High Autonomy with guidance.

PRESENT

Ia) Guidance through red light (if the data is missing).

PRESENT

Ib) Guidance through colouring requested items in VanWiechen scheme.

PRESENT

The screenshot shows a child profile on the left and a VanWiechen scheme on the right. The child profile includes fields for Kindnummer (0), Lokatie (Gouda Noord), Geslacht (jongen), Geboortedatum (29-10-2009), etniciteit (autochtone), Hoogste genoten opleiding vader / moeder (Basischool), Erfelijke belasting (Epilepsie), Leeftijd moeder bij bevalling (in jaren) (20), Meerling (Nee), and Apgarscore 5 minuten (empty input field with a red border). Below these are buttons for 'gegevens wijzigen' and 'opslaan'. To the right is a grid for the VanWiechen scheme, with columns for age groups: 1 mnd, 2 mnd, 3 mnd, 6 mnd, 9 mnd, 12 mnd, 15 jaar, and 2 jaar. The grid contains various items with colored backgrounds: grey for 'vloer', yellow for 'binnen bereik', and green for 'nog een in andere hand'. There are also sections labeled 'M' and 'F'.

II) Separate start screen

PRESENT, by keeping the VanWiechen scheme grey. Since only 2 persons mentioned this item it is unknown how the other physicians think about this topic. Because the field is grey but still visible, this seems like a good solution.

The screenshot shows a separate start screen for 'CB-Consult'. It includes fields for CB-Consult (Kindnummer, Meetmoment, Naam CB Arts, Meetdatum) and Uitkomsten (JOI). To the right is a 'Kind Achtergrond' form with fields for Kindnummer, Lokatie, Geslacht, Geboortedatum, etniciteit, Hoogste genoten opleiding vader / moeder, Erfelijke belasting, Leeftijd moeder bij bevalling (in jaren), Meerling, and Apgarscore 5 minuten. Below these are buttons for 'gegevens wijzigen' and 'opslaan'. At the bottom is a VanWiechen scheme grid for 'A. Fijne motoriek' with 16 items numbered 1 to 16. The grid shows grey bars for each item across the age groups: 1 mnd, 2 mnd, 3 mnd, 6 mnd, 9 mnd, 12 mnd, 15 jaar, and 2 jaar.

III) Information from top left positioned in order of physician - file - child data.
 ADAPTATION, physician and child file need to be reversed. Child data on the right is good.



Kind Achtergrond	
Kindnummer:	0
Lokatie:	Gouda Noord
Geslacht:	jongen
Geboortedatum:	29-10-2009
etniciteit:	autochtoon
Hoogst genoten opleiding vader / moeder:	Basisschool
Erfelijke belasting:	Epilepsie
Leeftijd moeder bij bevalling (in jaren):	20
Meerling:	Nee
Apgarscore 5 minuten:	5

CB-Consult

Kindnummer: 0
 Meetmoment: 9 Maanden
 Naam CB Arts: Test
 Meetdatum: 26-05-2010

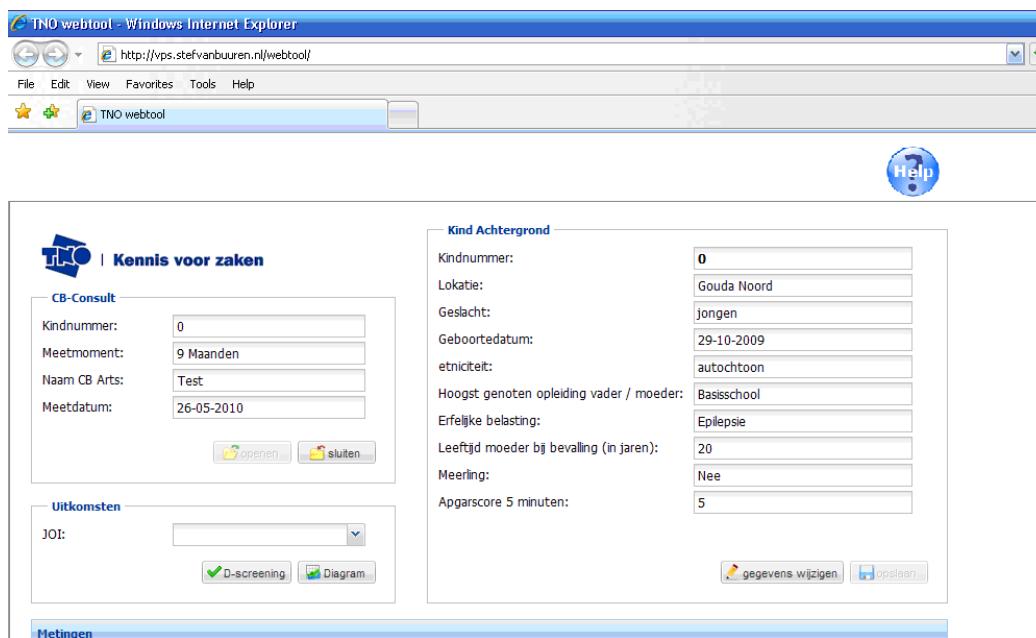
Uitkomsten

JOI:

D-screening Diagram

gegevens wijzigen opslaan

IV) Presence help button (right positioned).
 ADAPTATION, not yet available.

Kind Achtergrond	
Kindnummer:	0
Lokatie:	Gouda Noord
Geslacht:	jongen
Geboortedatum:	29-10-2009
etniciteit:	autochtoon
Hoogst genoten opleiding vader / moeder:	Basisschool
Erfelijke belasting:	Epilepsie
Leeftijd moeder bij bevalling (in jaren):	20
Meerling:	Nee
Apgarscore 5 minuten:	5

CB-Consult

Kindnummer: 0
 Meetmoment: 9 Maanden
 Naam CB Arts: Test
 Meetdatum: 26-05-2010

Uitkomsten

JOI:

D-screening Diagram

gegevens wijzigen opslaan

Metingen

V), Attendance action button (right positioned).

ADAPTATION, not yet available. (Button must have a more orange background for better readability).



TNO webtool - Windows Internet Explorer

<http://vps.stefvanbuuren.nl/webtool/>

File Edit View Favorites Tools Help

Actie Help

TNO | Kennis voor zaken

CB-Consult

- Kindnummer: 0
- Meetmoment: 9 Maanden
- Naam CB Arts: Test
- Meetdatum: 26-05-2010

Uitkomsten

JOI:

D-screening Diagram

Metingen

Kind Achtergrond

Kindnummer:	0
Lokatie:	Gouda Noord
Geslacht:	jongen
Geborstedatum:	29-10-2009
etniciteit:	autochtoon
Hoogst genoten opleiding vader / moeder:	Basischool
Erfelijke belasting:	Epilepsie
Leeftijd moeder bij bevalling (in jaren):	20
Meerling:	Nee
Apgarscore 5 minuten:	5

gegevens wijzigen opslaan

VI) Results (Thermometer and graph) lower right.

ADAPTATION, the results must be below / right of the VanWiechen scheme.

TNO | Kennis voor zaken

CB-Consult

- Kindnummer: 0
- Meetmoment: 9 Maanden
- Naam CB Arts: Test
- Meetdatum: 26-05-2010

Uitkomsten

JOI:

D-screening Diagram

Metingen

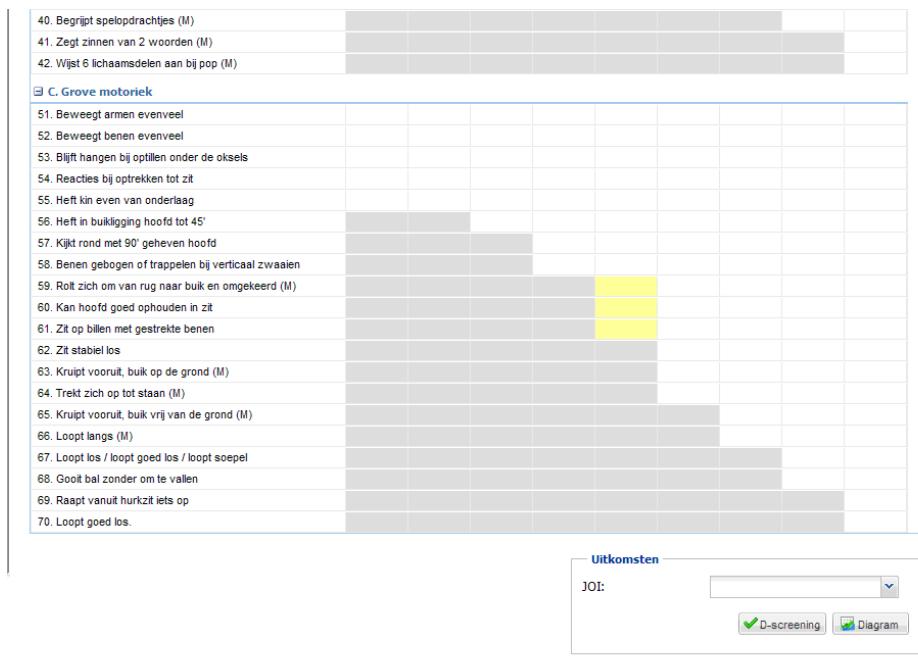
Kind Achtergrond

Kindnummer:	0
Lokatie:	Gouda Noord
Geslacht:	jongen
Geborstedatum:	29-10-2009
etniciteit:	autochtoon
Hoogst genoten opleiding vader / moeder:	Basischool
Erfelijke belasting:	Epilepsie
Leeftijd moeder bij bevalling (in jaren):	20
Meerling:	Nee
Apgarscore 5 minuten:	5

gegevens wijzigen opslaan

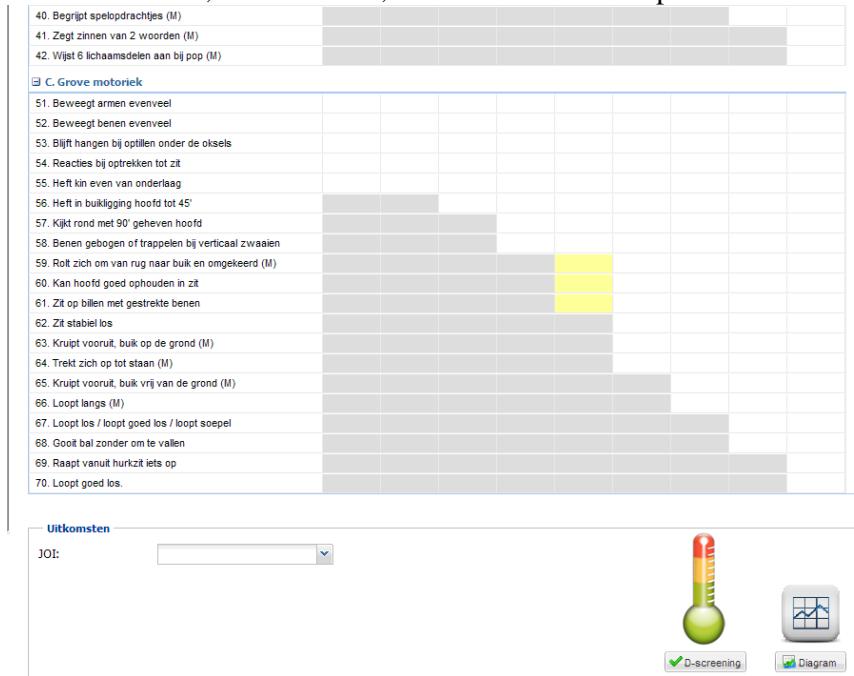
A. Fijne motoriek

1. Ogen fixeren	<input type="checkbox"/>
2. Volgt met ogen en hoofd 30° 0' 30'	<input type="checkbox"/>
3. Handen af en toe open	<input type="checkbox"/>



VII) Thermometer, graphs, help and action button should be visual/coloured buttons which are clickable.

ADJUSTMENT, for easier use, it is convenient if the picture/icon itself is also clickable.



VIII) Background information VanWiechen scheme.

NOT PRESENT, given the resources this is not yet possible. Users have this information available through a book as well.

IX) No Scrolling.

NOT PRESENT, a format is chosen with the VanWiechen scheme requiring scrolling. This

makes sure that the list continues, granting an overview, and is perhaps therefore not perceived negatively.

X) Tab or use the keyboard to navigate.

NOT PRESENT, this is not possible, since the vanWiechen items are rated by a point and click selection format.

Example of the new webtool:

The screenshot shows the INO webtool interface in Internet Explorer. The top navigation bar includes tabs for 'File', 'Edit', 'View', 'Favorites', 'Tools', and 'Help'. Below the navigation bar, there are links for 'TNO' and 'Kennis voor zaken'. On the right side of the header are 'Actie' and 'Help' buttons. The main content area is divided into several sections:

- Algemeen:** Contains fields for 'Naam CB Arts:' (Test) and 'Meetdatum:' (26-05-2010).
- CB-Consult:** Contains fields for 'Kindnummer:' (2222) and 'Meetmoment:' (24 Maanden).
- Kind Achtergrond:** Displays child background information: Kindnummer: 2222, Lokatie: Gouda Noord, Geschlecht: Jongen, Geboortedatum: 07-10-2009, etniciteit: allochtoon, Hoogst genoten opleiding vader / moeder: Universiteit, Erfelijke belasting: Geen van bovenstaande, Leeftijd moeder bij bevalling (in jaren): 24, Meerling: Nee, Apgarscore 5 minuten: 3.
- Metingen:** This section contains two main tables of measurements:
 - A. Fijne motoriek:** A table with 16 items, each with a checkbox and a rating scale from - to +. Items include: Ogen fixeren, Volgt met ogen en hoofd 30° 0' 30', Handen af en toe open, Kijkt naar eigen handen (M), Speelt met handen middenvoor, Pakt in rugligging voorwerp binnen bereik, Pakt blokje over, Houdt blokje vast, pakt er nog een in andere hand, Speelt met beide voeten (M), Pakt propje met duim en wijsvinger, Doet blokje in/ uit doos, Speelt geven en nemen (M), Stapelt 2 blokjes, Gaat op onderzoek uit (M), Stapelt 3 blokjes, Doet anderen na (M).
 - B. Communicatie:** A table with 3 items, each with a rating scale from - to +. Items include: Begrijpt spelopdrachten (M), Zegt zinnen van 2 woorden (M), Wijst 6 lichaamsdelen aan bij pop (M).
- C. Grove motoriek:** A table with 70 items, each with a rating scale from - to +. Items include: Beweegt armen evenveel, Beweegt benen evenveel, Blijft hangen bij optillen onder de oksels, Reacties bij optrekken tot zit, Heft kin even van onderlaag, Heft in buikligging hoofd tot 45°, Kijkt rond met 50° gehouden hoofd, Benen gebogen of trappen bij verticaal zwaaieren, Rollt zich om van rug naar buik en omgekeerd (M), Kan hoofd goed ophouden in zit, Zit op billen met gestrekte benen, Zit stabiel los, Kruip vooruit, buik op de grond (M), Trekt zich op tot staan (M), Kruip vooruit, buik vrij van de grond (M), Loopt langs (M), Loopt los / loopt goed los / loopt soepel, Gooit bal zonder om te vallen, Raapt vanuit hurkzit iets op, Loopt goed los.
- Uitkomsten:** A section with a dropdown menu for 'JOI:' and a 'D-screening' button with a thermometer icon.

H Results literature search for factors

Article	Functionality delivered	Effort efficiency	Task/Activity Tuned	Interface layout	User support (help, training, organizational)	Information/Content delivery	Flexibility (ease of correcting, quit options, customizable)	User characteristics (motivation, self efficacy)
# mentioned	7	7	6	9	11	5	6	2
User certification of workplace software: assessing both artefact and usage [Walldius, Sundblad, Bengtsson, Sandblad and Gulliksen 2009]	X	X	X		X			
Usability Evaluation Based on International Standards for Software Quality Evaluation [Toshihiro 2008]	X	X		X			X	
Measuring the usability of software components [Bertoia, Troya and Vallecillo 2006]				X	X			
Extending the technology acceptance model with task-technology fit constructs [Dishaw and Strong 1998]	X		X			X		
The Development and Evaluation of a Survey to Measure User Engagement [O'Brien and Toms 2010]				X				
CPOE System Design Aspects and Their Qualitative Effect on Usability [Khajouei and Jaspers 2008]				X	X		X	
A structured methodology for comparative evaluation of user interface designs using usability criteria and			X		X		X	

measures [Park and Lim 1999]								
Delivering Ease of Use [Simon Hakiel 1997]			X	X	X			
Flow experiences in information technology use [Pilke 2004]	X	X		X				
An interactive multimedia tutorial for user interface design [Aalst, Van der Mast and Carey 1995]								
The Impact of Visual Layout Factors on Performance in Web Pages: A Cross-Language Study [Parush, Shwarts, Shtub and Chandra 2005]				X		X		
The relation of interface usability characteristics, perceived usefulness, and perceived ease of use to end-user satisfaction with enterprise resource planning (ERP) systems [Calisir and Calisir 2004]					X		X	
Usability Meanings and Interpretations in ISO Standards [Abran, Khelifi and Suryn 2003]	X	X						
User-Process Model Approach to Improve User Interface Usability [Ju and Gluck 2005]			X					
Web Site Usability, Design, and Performance Metrics [Palmer 2002]				X	X	X		
Variables affecting information technology end-user satisfaction: a meta-analysis					X	X		

of the empirical literature [Mahmood, Burn, Gemoets and Jacquez 2000]								
Performance-Related Metrics in the ISO 9126 Standard [Becker 2008]	X	X						
Guidelines for Eliciting Usability Functionalities [Juristo, Moreno, and Sanchez-Segura 2007]					X		X	
A Comprehensive Model of Usability [Winter, Wagner and Deissenboeck 2008]	X	X						
Human Interface Interaction		X	X	X		X	X	
Technology Acceptance Model 3 and a Research Agenda on Interventions [Venkatesh and Bala 2008]					X			X
Effects of self-efficacy on computer usage [Igbaria and Iivari 1995]					X			X

I INTERVIEW II TEXT AND FORM

Evaluatie interview voor webtool *D*-screening

Beste JGZ arts,

De afgelopen periode heeft u gewerkt met de webtool voor het gebruik van de *D*-screening. Het is goed om die ervaring te evalueren. Daarbij wil ik u hier alvast bedanken voor de tijd om dit interview schriftelijk in te vullen.

Het interview bestaat uit 3 onderdelen. Het eerste onderdeel evalueert vanuit uw werkproces. Het tweede evalueert op basis van de onderdelen van de webtool. Het derde deel bestaat uit een aantal overige vragen. Elk onderdeel wordt met een korte uitleg ingeleid.

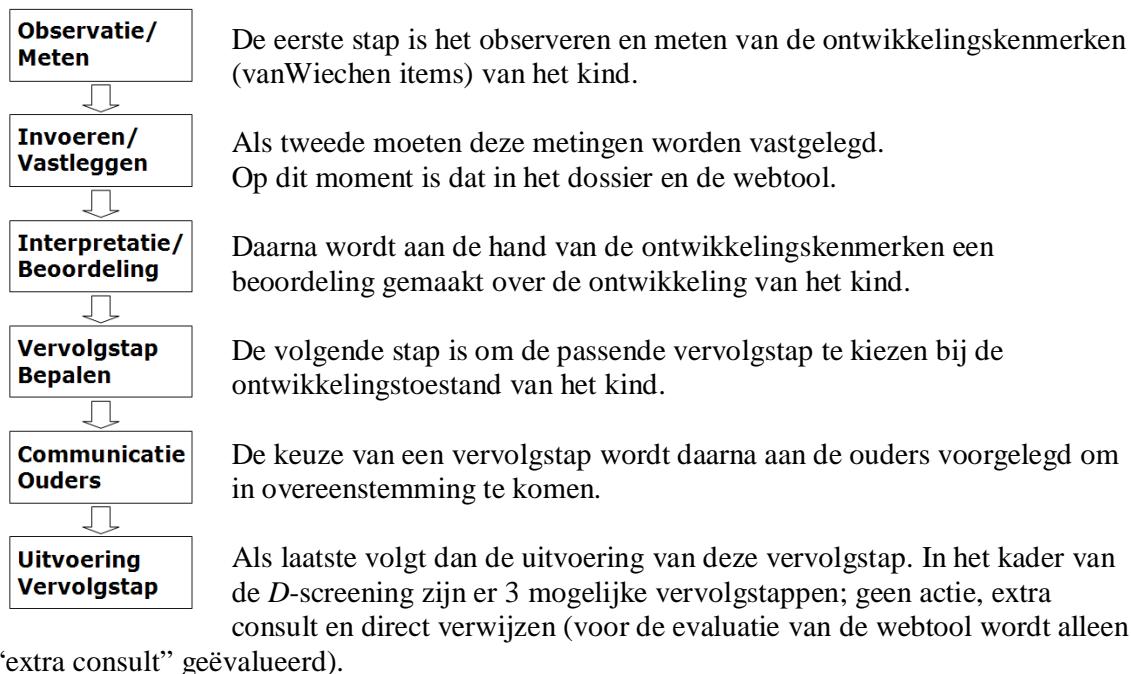
Succes met invullen!

Vriendelijke groet,

Ewoud van Helden
TNO-stagiair

Onderdeel 1: Evaluatie vanuit het werkproces.

Dit onderdeel is opgebouwd aan de hand van het werkproces van de JGZ-arts. De stappen van de JGZ arts zijn als volgt te beschrijven.



Deze 6 stappen worden elk afzonderlijk geëvalueerd. We willen graag weten wat de ervaring was met de webtool in deze stap en of het een positieve of negatieve invloed had. We zijn ook benieuwd wat het effect was voor de betreffende stap (maakte de webtool de stap makkelijker, was er meer of minder tijd nodig voor het uitvoeren van de stap, leidde de webtool tot meer uniform gebruikt/meer volgens protocol, etc.). Op elke vraag volgt een stelling waarbij het gekozen antwoord aangevinkt/ omcirkelt/ onderstreept (indien digitaal) kan worden.

Probeer zo uitgebreid mogelijk te beantwoorden, dit verbetert de evaluatie.

Vragen:

1.1) Ondersteunt de webtool bij het goed observeren en meten van de ontwikkeling van het kind?
Toelichting?

Waarin uit zich dat? (bijv. makkelijker, sneller, nauwkeuriger, minder fouten, uniform/protocol)

De webtool ondersteunt bij het goed observeren en meten van de ontwikkeling van het kind.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.2) Ondersteunt de webtool bij het goed vastleggen/invoeren van de resultaten van de metingen van de ontwikkeling van het kind?

Toelichting?

Waarin uit zich dat? (bijv. makkelijker, sneller, nauwkeuriger/precies/volledig, minder fouten, uniform/protocol)

De webtool ondersteunt bij het goed vastleggen/invoeren van de resultaten van de metingen van de ontwikkeling van het kind.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.3) Ondersteunt de webtool bij het goed interpreteren en beoordelen van de metingen?

Toelichting?

Waarin uit zich dat? (bijv. makkelijker, sneller, beter/nauwkeuriger, uniform/protocol)

De webtool ondersteunt bij het goed interpreteren en beoordelen van de metingen.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

Ondersteunt de webtool bij het bepalen van de juiste vervolgstap?

Toelichting?

Waarin uit zich dat? (bijv. sneller, makkelijker, vaker juiste/beste besluiten/vervolgstappen, uniform/protocol)

De webtool ondersteunt bij het bepalen van de juiste vervolgstap.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.4) Ondersteunt de webtool bij het communiceren over de resultaten van het ontwikkelingsonderzoek van het kind met de ouders?

Toelichting?

Waarin uit zich dat? (bijv. makkelijker, sneller, duidelijker, overtuigender, subtieler/sympathiek, uniform/protocol)

De webtool ondersteunt bij het goed communiceren over de resultaten van het ontwikkelingsonderzoek van het kind met de ouders.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.6) Ondersteunt de webtool bij het goed uitvoeren van het extra consult?

Toelichting?

Waarin uit zich dat? (bijv. betere communicatie, makkelijker consult, makkelijker voorbereiden, uniform/protocol)

De webtool ondersteunt bij het goed uitvoeren van het extra consult.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

Onderdeel 2: Evaluatie vanuit de webtool.

In dit onderdeel wordt de webtool geëvalueerd aan de hand van de onderdelen van de webtool. De webtool bestaat uit een aantal invulvelden en knoppen die in meer of mindere mate hebben bijgedragen aan de uitvoering van de D-screening en de taken van de JGZ arts.

Vragen:

2.1) Sloot de manier van werken met de webtool aan op uw manier van werken in de praktijk, c.q. verstoordde het deze manier van werken?

2.2) Inloggen

Waren hier problemen mee?

2.3) Algemene gegevens (artsnaam en meetdatum)

Algemeen	
Naam CB Arts:	P de Vries
Meetdatum:	09-06-2010

- a) Was het direct duidelijk wat er van u verwacht werd?
- b) Was het direct duidelijk hoe u dat moest doen?
- c) Waarin is dit een toevoeging voor uw werkzaamheden?
- d) Waarin is dit een belemmering voor uw werkzaamheden?
- e) Op-/aanmerkingen? (problemen of verbeterpunten)

2.4) CB-consult (kindnummer en meetmoment)

CB-Consult	
Kindnummer:	12345
Meetmoment:	<input type="button" value="openen"/>
<input type="button" value="openen"/> <input type="button" value="sluiten"/>	

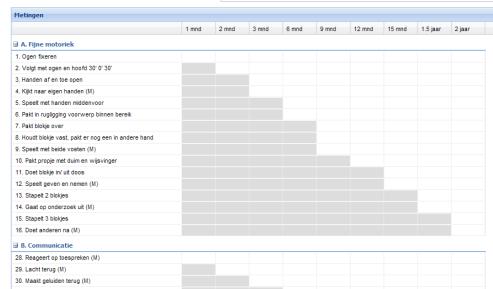
- a) Was het direct duidelijk wat er van u verwacht werd?
- b) Was het direct duidelijk hoe u dat moest doen?
- c) Waarin is dit een toevoeging voor uw werkzaamheden?
- d) Waarin is dit een belemmering voor uw werkzaamheden?
- e) Op-/aanmerkingen? (problemen of verbeterpunten)

2.5) Kind achtergrond

Kind Achtergrond	
Kindnummer:	12345
Lokatie:	Nieuwerkerk
Geslacht:	jongen
Geborendatum:	16-09-2009
Etniciteit:	autochtone
Hoogst genoten opleiding vader / moeder:	Havo
Erfelijke belasting:	Geen van bovenstaande
Leeftijd moeder bij bevalling (in jaren):	27
Meerling:	Nee
Apgarscore na 5 minuten:	9
<input type="button" value="gegevens wijzigen"/> <input type="button" value="opslaan"/>	

- a) Was het direct duidelijk wat er van u verwacht werd?
- b) Was het direct duidelijk hoe u dat moest doen?
- c) Was de informatie die u hiervoor nodig had goed beschikbaar?
- d) Waarin is dit een toevoeging voor uw werkzaamheden?
- e) Waarin is dit een belemmering voor uw werkzaamheden?
- f) Op-/aanmerkingen? (problemen of verbeterpunten)

2.6) Metingen (vanWiechenschema)



- a) Was het direct duidelijk wat er van u verwacht werd?
- b) Was het direct duidelijk hoe u dat moest doen?
- c) Waarin is dit een toevoeging voor uw werkzaamheden?
- d) Waarin is dit een belemmering voor uw werkzaamheden?
- e) Op-/aanmerkingen? (problemen of verbeterpunten)

2.7) JOI (jeugdarts ontwikkelingsindruck)

The figure shows a screenshot of a computer screen displaying the 'JOI' (jeugdarts ontwikkelingsindruck) interface. At the top, there is a header bar with the title 'Resultaten'. Below this, there is a table with two rows. The first row contains the question 'JOI:' followed by a text input field containing 'NO'. The second row contains the question 'Besluit Arts:' followed by a text input field containing 'Geen vervolgactie'.

JOI:	NO
Besluit Arts:	Geen vervolgactie

- a) Was het direct duidelijk wat er van u verwacht werd?
- b) Was het direct duidelijk hoe u dat moest doen?
- c) Waarin is dit een toevoeging voor uw werkzaamheden?
- d) Waarin is dit een belemmering voor uw werkzaamheden?
- e) Op-/aanmerkingen? (problemen of verbeterpunten)

2.8) Thermometer



- a) Was het direct duidelijk wat er van u verwacht werd?
- b) Was het direct duidelijk hoe u dat moest doen?
- c) Hoe heeft u de thermometer gebruikt?
- d) Wat vindt u van de informatie die de thermometer geeft?
- e) Heeft de thermometer geleid tot andere/betere besluiten (of andere besluitvorming)?
- f) Waarin is dit een toevoeging voor uw werkzaamheden (specifiek ook naar ouders toe)?
- g) Waarin is dit een belemmering voor uw werkzaamheden?
- h) Op-/aanmerkingen? (problemen of verbeterpunten)

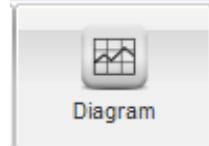
2.9) Besluit

Besluit Arts:

- a) Was het direct duidelijk wat er van u verwacht werd?

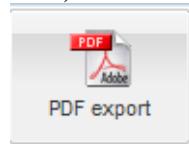
- b) Was het direct duidelijk hoe u dat moest doen?
- c) Heeft de webtool geleid tot andere besluiten (of andere besluitvorming)? Zo ja, welke?
- d) Waarin is dit een toevoeging voor uw werkzaamheden?
- e) Waarin is dit een belemmering voor uw werkzaamheden?
- f) Op-/aanmerkingen? (problemen of verbeterpunten)

2.10) Diagram



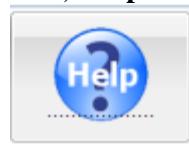
- a) Was het direct duidelijk wat er van u verwacht werd?
- b) Was het direct duidelijk hoe u dat moest doen?
- c) Heeft u gebruik gemaakt van het diagram? En zo ja: Hoe?
- d) Was het duidelijk wat de informatie betekende/hoe die geïnterpreteerd moest worden?
- e) Wat vindt u van de informatie die het diagram geeft?
- f) Waarin is dit een toevoeging voor uw werkzaamheden (specifiek ook naar ouders toe)?
- g) Waarin is dit een belemmering voor uw werkzaamheden?
- h) Op-/aanmerkingen? (problemen of verbeterpunten)

2.11) PDF functie



- a) Was het duidelijk welke functie deze knop heeft?
- b) Hoe vaak heeft u gebruik gemaakt van de PDF functie?
- c) Wat vindt u van de informatie die de PDF functie geeft?
- d) Op-/aanmerkingen? (problemen of verbeterpunten)

2.12) Help functie



- a) Was het duidelijk wat er achter de Help functie knop zit?
- b) Hoe vaak heeft u gebruik gemaakt van de Help functie?
- c) Vond u de informatie bruikbaar (stond alles erin)?
- d) Was de help functie voldoende of had u liever meer ondersteuning gehad? Wie/hoe had dat eruit moeten zien?
- e) Waarin is dit een toevoeging voor uw werkzaamheden?
- f) Waarin is dit een belemmering voor uw werkzaamheden?
- g) Op-/aanmerkingen? (problemen of verbeterpunten)

2.13) Actie functie



- a) Was het duidelijk wat er achter de Help functie knop zit?
- b) Hoe vaak heeft u gebruik gemaakt van de Actie functie?
- c) Vond u de informatie bruikbaar?
- d) Waarin is dit een toevoeging voor uw werkzaamheden?
- e) Waarin is dit een belemmering voor uw werkzaamheden?
- f) Op-/aanmerkingen? (problemen of verbeterpunten)

2.14) Welke handelingen (met de webtool en het gebruik rondom de webtool) vindt u omslachtig, onduidelijk, of nutteloos?

Onderdeel 3: Algemene vragen

In dit onderdeel worden nog een aantal vragen gesteld. Het begint met 3 stellingen (en bijbehorende toelichting), gevolgd met een vraag over hoe u de webtool in toekomstig gebruik ziet. Het eindigt met ruimte voor reacties die u nergens anders kwijt kon (ervaringen, verbeterpunten, vragen, etc.). Probeer de vragen weer zo uitgebreid mogelijk te beantwoorden.

Vragen:

3.1) Stelling: De webtool is makkelijk in het gebruik.

0 **Helemaal mee oneens** 0 **Mee oneens** 0 **Noch oneens/noch eens** 0 **Mee eens** 0 **Helemaal mee eens**
Toelichting?

3.2) Stelling: De webtool is effectief, het werken met de *D*-screening wordt erdoor verbeterd.
0 **Helemaal mee oneens** 0 **Mee oneens** 0 **Noch oneens/noch eens** 0 **Mee eens** 0 **Helemaal mee eens**
Toelichting?

3.3) Stelling: De *D*-screening is effectief, het verbetert het resultaat van mijn werk.

0 **Helemaal mee oneens** 0 **Mee oneens** 0 **Noch oneens/noch eens** 0 **Mee eens** 0 **Helemaal mee eens**
Toelichting?

3.4) Stel de *D*-screening (thermometer en *D*-scorediagram) is in het digitaal dossier aanwezig.

a) Zou u deze dagelijks gebruiken?

b) Ziet u er een meerwaarde in?

Zo ja, wat is die meerwaarde dan?

Zo nee, wat zijn de problemen/drempels waar u tegen aanloopt?

3.5) Overige reacties.

Hartelijk dank voor uw medewerking!

J Interview II response

Evaluatie interview voor webtool *D*-screening

YHP 1

Beste JGZ arts,

De afgelopen periode heeft u gewerkt met de webtool voor het gebruik van de *D*-screening. Het is goed om die ervaring te evalueren. Daarbij wil ik u hier alvast bedanken voor de tijd om dit interview schriftelijk in te vullen.

Het interview bestaat uit 3 onderdelen. Het eerste onderdeel evalueert vanuit uw werkproces. Het tweede evalueert op basis van de onderdelen van de webtool. Het derde deel bestaat uit een aantal overige vragen. Elk onderdeel wordt met een korte uitleg ingeleid.

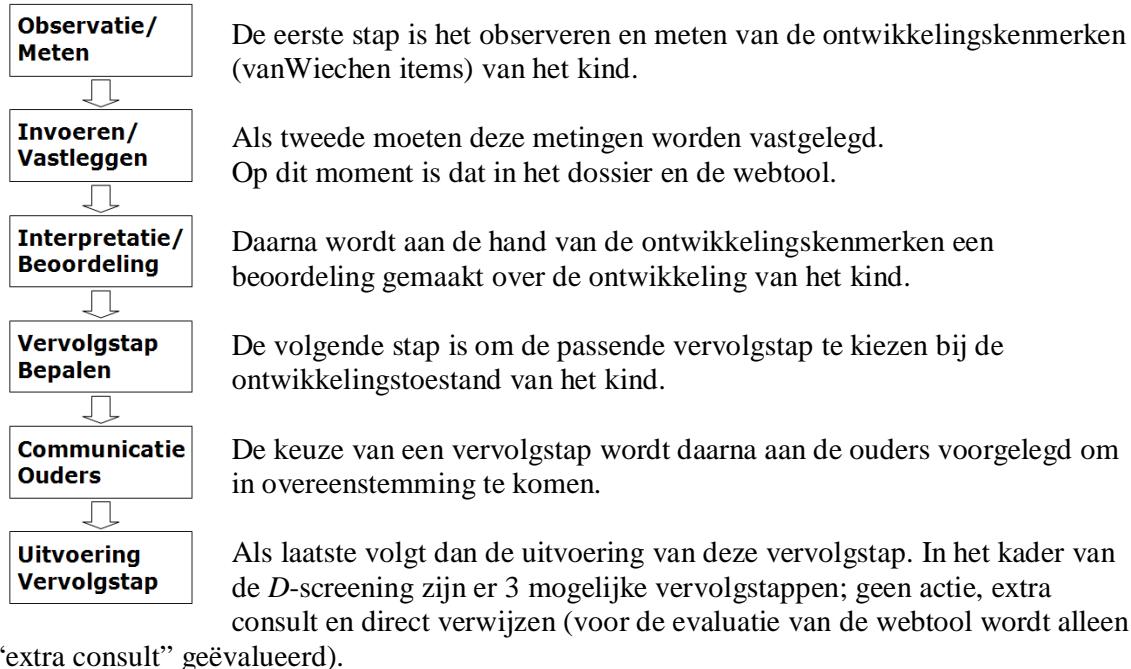
Succes met invullen!

Vriendelijke groet,

Ewoud van Helden
TNO-stagiair

Onderdeel 1: Evaluatie vanuit het werkproces.

Dit onderdeel is opgebouwd aan de hand van het werkproces van de JGZ-arts. De stappen van de JGZ arts zijn als volgt te beschrijven.



Deze 6 stappen worden elk afzonderlijk geëvalueerd. We willen graag weten wat de ervaring was met de webtool in deze stap en of het een positieve of negatieve invloed had. We zijn ook benieuwd wat het effect was voor de betreffende stap (maakte de webtool de stap makkelijker, was er meer of minder tijd nodig voor het uitvoeren van de stap, leidde de webtool tot meer uniform gebruikt/meer volgens protocol, etc.). Op elke vraag volgt een stelling waarbij het gekozen antwoord aangevinkt/ omcirkelt/ onderstreept (indien digitaal) kan worden.

Probeer zo uitgebreid mogelijk te beantwoorden, dit verbetert de evaluatie.

Vragen:

1.1) Ondersteunt de webtool bij het goed observeren en meten van de ontwikkeling van het kind?

Nee

Toelichting?

Items van Wiechen veranderen niet, waardoor observeren ook niet verandert

Waarin uit zich dat? (bijv. makkelijker, sneller, nauwkeuriger, minder fouten, uniform/protocol)

De webtool ondersteunt bij het goed observeren en meten van de ontwikkeling van het kind.

0 Helemaal mee oneens 0 Mee oneens 0 Noch oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.2) Ondersteunt de webtool bij het goed vastleggen/invoeren van de resultaten van de metingen van de ontwikkeling van het kind?

Nee

Toelichting?

Je registreert eerst op papier, daarna in de webtool.

Waarin uit zich dat? (bijv. makkelijker, sneller, nauwkeuriger/precies/volledig, minder fouten, uniform/protocol)

+ Het kost weinig extra tijd.

+/- Je moet preciezer invullen, waarbij je soms M wilt invullen terwijl dit niet kan (volgends protocol). Als ouder het aangeeft is dit wel informatie, maar niet gelijk +, maar wel meer dan -. Precisie en protocol geven geen ruimte voor nuance.

- Door de oplichtende (gele) items vergeet/vul je de hogere of lagere items (doorscoren) niet in.

De webtool ondersteunt bij het goed vastleggen/invoeren van de resultaten van de metingen van de ontwikkeling van het kind.

0 Helemaal mee oneens 0 Mee oneens 0 Noch oneens/noch eens 0 Mee eens 0 Helemaal mee eens
(vanwege gele oplichten)

1.3) Ondersteunt de webtool bij het goed interpreteren en beoordelen van de metingen?

Toelichting?

- Dossier geeft ook verleden weer en meer informatie (toestand kind, opmerkingen)

+ screening/thermometer zegt wel wat. Omdat het nu nog in onderzoeksfase zit ondersteunt het minder, het vertrouwen ontbreekt. Ook naar ouders toe kun je niet hard aangeven dat de thermometer gelijk heeft.

- screening geeft kans voor later, maar wat betekent dat voor je besluit nu (je ziet geen problemen bij het kind, maar thermometer zegt van wel). Liever nu iets doen als je nu zorgen observeert.

Waarin uit zich dat? (bijv. makkelijker, sneller, beter/nauwkeuriger, uniform/protocol)

De webtool ondersteunt bij het goed interpreteren en beoordelen van de metingen.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens
(tot de waarde van de screening eter vaststaat: dan wel “mee eens”)

1.4) Ondersteunt de webtool bij het bepalen van de juiste vervolgstap?

Toelichting?

+help heeft het protocol, maar de inhoud was al bekend.

Informatie is wel bij de hand.

+je wordt door de webtool bewust van je keuzes en observaties. Je hebt items nodig (bewust observeren) en je moet kiezen uit de opties die de webtool geeft.

-Zou mooi zijn als de thermometer tips zou geven (popup mogelijkheid voor wat de webtool/protocol adviseert)

Waarin uit zich dat? (bijv. sneller, makkelijker, vaker juiste/beste besluiten/vervolgstappen, uniform/protocol)

Screening =formaliseren = uniform maken.

De webtool ondersteunt bij het bepalen van de juiste vervolgstap.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.5) Ondersteunt de webtool bij het communiceren over de resultaten van het ontwikkelingsonderzoek van het kind met de ouders?

Toelichting?

+Los van de uitslag (of die klopt), thermometer ook gebruikt om aan ouders te laten zien waar het kind zit in de populatie (zitten kinderen nog lager, maar ook kinderen hoger. Ondanks hoger nog steeds groen). “Nog in het groen zitten” helpt om ouders gerust te stellen.

-Lastig als jij zorgen hebt maar thermometer geeft groen aan.

Waarin uit zich dat? (bijv. makkelijker, sneller, duidelijker, overtuigender, subtieler/sympathiek, uniform/protocol)

Duidelijker verhaal omdat je een plaatje erbij hebt.

De webtool ondersteunt bij het goed communiceren over de resultaten van het ontwikkelingsonderzoek van het kind met de ouders.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.6) Ondersteunt de webtool bij het goed uitvoeren van het extra consult?

Toelichting?

+- Soms is de grafiek heel inzichtelijk maar soms ook helemaal niet.

-Je moet vooraf zien of je het wilt/kunt gebruiken.

Waarin uit zich dat? (bijv. betere communicatie, makkelijker consult, makkelijker voorbereiden, uniform/protocol)

De communicatie is helderder.

De webtool ondersteunt bij het goed uitvoeren van het extra consult.

0 Helemaal mee oneens 0 Mee oneens [0 Noch oneens/noch eens](#) 0 Mee eens 0 Helemaal mee eens
(soms wel, soms niet)

Onderdeel 2: Evaluatie vanuit de webtool.

In dit onderdeel wordt de webtool geëvalueerd aan de hand van de onderdelen van de webtool. De webtool bestaat uit een aantal invulvelden en knoppen die in meer of mindere mate hebben bijgedragen aan de uitvoering van de *D*-screening en de taken van de JGZ arts.

Vragen:

2.1) Sloot de manier van werken met de webtool aan op uw manier van werken in de praktijk, c.q. verstoordde het deze manier van werken?

Het was wel een apart/extraling met nieuwe taken. Niet ingewikkeld maar wel een extra handeling.

2.2) Inloggen

Waren hier problemen mee?

Één keer dat het systeem vastliep, opnieuw opstarten hielp niet (misschien verkeerd wachtwoord). Daarna altijd ok.

Algemeen	
Naam CB Arts:	P de Vries
Meetdatum:	09-06-2010

2.3) Algemene gegevens (artsnaam en meetdatum)

a) Was het direct duidelijk wat er van u verwacht werd?

Ja

b) Was het direct duidelijk hoe u dat moest doen?

Ja

c) Waarin is dit een toevoeging voor uw werkzaamheden?

Niet

d) Waarin is dit een belemmering voor uw werkzaamheden?

Niet

e) Op-/aanmerkingen? (problemen of verbeterpunten)

Nee

2.4) CB-consult (kindnummer en meetmoment)

CB-Consult

Kindnummer:	12346
Meetmoment:	<input type="button" value=""/>
<input type="button" value="openen"/> <input type="button" value="sluiten"/>	

a) Was het direct duidelijk wat er van u verwacht werd?

Ja

b) Was het direct duidelijk hoe u dat moest doen?

Ja

c) Waarin is dit een toevoeging voor uw werkzaamheden?

niet

d) Waarin is dit een belemmering voor uw werkzaamheden?

5 cijferig systeem gaat naar 6 cijfers wat nog niet mogelijk is (wordt aan gewerkt)

e) Op-/aanmerkingen? (problemen of verbeterpunten)

nee

2.5) Kind achtergrond

Kind Achtergrond

Kindnummer:	12345
Lokatie:	Nieuwerkerk
Geslacht:	jongen
Geboortedatum:	16-09-2009
Etniciteit:	autochtone
Hoogst genoten opleiding vader / moeder:	Havo
Erfelijke belasting:	Geen van bovenstaande
Leeftijd moeder bij bevalling (in jaren):	27
Meerling:	Nee
Apgarscore na 5 minuten:	9
<input type="button" value="gegevens wijzigen"/> <input type="button" value="opslaan"/>	

a) Was het direct duidelijk wat er van u verwacht werd?

Ja, behalve in sommige gevallen van erfelijke belasting of apgarscore onbekend wat er gekozen moet worden.

b) Was het direct duidelijk hoe u dat moest doen?

Ja

c) Was de informatie die u hiervoor nodig had goed beschikbaar?

Algemeen wel

d) Waarin is dit een toevoeging voor uw werkzaamheden?

Je wordt bewust van de achtergrondkenmerken invloed.

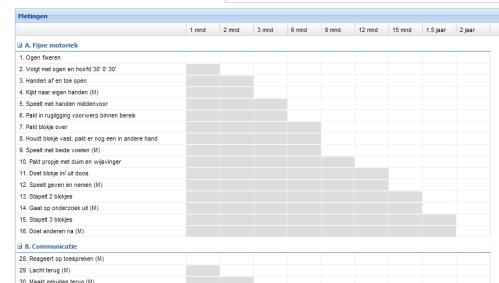
e) Waarin is dit een belemmering voor uw werkzaamheden?

Nee, had wel reactie van ouders verwacht (over waarom ze allochtone of opleiding willen weten/ertoe doet), maar viel mee.

f) Op-/aanmerkingen? (problemen of verbeterpunten)

Tab en toetsenboard bediening moet mogelijk zijn
 Kalender met toetsenboard kunnen invoeren. Huidige kalender werd per maand terug gedaan naar geboorte datum.

2.6) Metingen (vanWiechenschema)



a) Was het direct duidelijk wat er van u verwacht werd?

Ja

b) Was het direct duidelijk hoe u dat moest doen?

Ja

c) Waarin is dit een toevoeging voor uw werkzaamheden?

Niet

d) Waarin is dit een belemmering voor uw werkzaamheden?

Dubbel werk (met dossier), de webtool liep vast aan het eind van de middag

e) Op-/aanmerkingen? (problemen of verbeterpunten)

Geel zorgt ervoor dat je overige items niet invult (niet doorscoren)

Als je snel klikt reageert/pakt ie niet altijd.

2.7) JOI (jeugdarts ontwikkelingsindruck)

JOI:	NO
Besluit Arts:	Geen vervolgactie

a) Was het direct duidelijk wat er van u verwacht werd?

Niet door webtool, wel door training

b) Was het direct duidelijk hoe u dat moest doen?

Ja

c) Waarin is dit een toevoeging voor uw werkzaamheden?

Bewust de afweging maken. Kies je voor “normaal”, zo nee welk gebied dan en wat voor vervolg stap. Ook bewuster naar ouders toe in je keus.

d) Waarin is dit een belemmering voor uw werkzaamheden?

Niet

e) Op-/aanmerkingen? (problemen of verbeterpunten)

Webtool werd samen met ouders ingevuld, dus ook open over joi. Mag dus minder cryptisch, je hebt die mening of zorg gewoon over dat kind.

2.8) Thermometer



a) Was het direct duidelijk wat er van u verwacht werd?

Ja

Altijd aan ouders laten zien (ook al is alles plus) omdat ze het verwachten als je ze hebt gevraagd voor onderzoek en alles hebt ingevuld (wel hopen dat thermometer ook groen uitkomt).

b) Was het direct duidelijk hoe u dat moest doen?

Ja

c) Hoe heeft u de thermometer gebruikt?

Om vervolgstap te bepalen

Verhaal “geen zorgen” ondersteunen met groene thermometer.

d) Wat vindt u van de informatie die de thermometer geeft?

Helder

Soms grensvlak onduidelijk (lijn ligt tussen 2 kleuren), getal mist

Nuttig, meer of ander beeld dan normaal

e) Heeft de thermometer geleid tot andere/betere besluiten (of andere besluitvorming)?

Ja, verwacht het wel, maar nog erg korte periode van gebruik

f) Waarin is dit een toevoeging voor uw werkzaamheden (specifiek ook naar ouders toe)?

Objectiever beeld dan alleen eigen subjectieve beeld

Ook naar ouders objectiever en visueel. Geen negatieve reactie op gebruik van thermometer (kind langs de lat leggen op zón jonge leeftijd of zo).

g) Waarin is dit een belemmering voor uw werkzaamheden?

niet

h) Op-/aanmerkingen? (problemen of verbeterpunten)

Score of tekst voor twijfel geval (de kleur in tekst ook weergeven)

2.9) Besluit

Besluit Arts:

Geen vervolgactie

a) Was het direct duidelijk wat er van u verwacht werd?

ja

b) Was het direct duidelijk hoe u dat moest doen?

ja

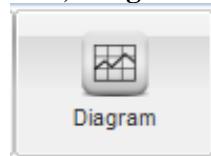
c) Heeft de webtool geleid tot andere besluiten (of andere besluitvorming)? Zo ja, welke?
Protocol soms ook

d) Waarin is dit een toevoeging voor uw werkzaamheden?
niet

e) Waarin is dit een belemmering voor uw werkzaamheden?
niet

f) Op-/aanmerkingen? (problemen of verbeterpunten)
nee

2.10) Diagram



a) Was het direct duidelijk wat er van u verwacht werd?

ja

b) Was het direct duidelijk hoe u dat moest doen?

ja

c) Heeft u gebruik gemaakt van het diagram? En zo ja: Hoe?

Nee (wel bekijken)

d) Was het duidelijk wat de informatie betekende/hoe die geïnterpreteerd moest worden?
Moeilijk interpreteren door schokkerig verloop

e) Wat vindt u van de informatie die het diagram geeft?

Thermometer (screening) en diagram anders door achtergrond kenmerken, dat is lastig uit te leggen aan ouders. Ouders kunnen ook invloed van achtergrond kenmerken beseffen (dat hun opleiding of zo dus invloed zou hebben)

f) Waarin is dit een toevoeging voor uw werkzaamheden (specifiek ook naar ouders toe)?

Niet, doordat er maar een paar diagrammen “mooi” je verhaal ondersteunen en die paar eruit pikken is niet eerlijk.

g) Waarin is dit een belemmering voor uw werkzaamheden?

h) Op-/aanmerkingen? (problemen of verbeterpunten)

nee

2.11) PDF functie



a) Was het duidelijk welke functie deze knop heeft?

ja

b) Hoe vaak heeft u gebruik gemaakt van de PDF functie?

0

c) Wat vindt u van de informatie die de PDF functie geeft?

Zelfde als thermometer en diagram (als landelijk wordt ingevoerd dan zou het bij verwijzen handig zijn om uitdraai bij te voegen (moet arts het natuurlijk ook kunnen interpreteren))

d) Op-/aanmerkingen? (problemen of verbeterpunten)

niet

2.12) Help functie



a) Was het duidelijk wat er achter de Help functie knop zit?

ja

b) Hoe vaak heeft u gebruik gemaakt van de Help functie?

0

c) Vond u de informatie bruikbaar (stond alles erin)?

d) Was de help functie voldoende of had u liever meer ondersteuning gehad? Wie/hoe had dat eruit moeten zien?

nee

e) Waarin is dit een toevoeging voor uw werkzaamheden?

Prettig achter de hand

f) Waarin is dit een belemmering voor uw werkzaamheden?

niet

g) Op-/aanmerkingen? (problemen of verbeterpunten)

nee

2.13) Actie functie



a) Was het duidelijk wat er achter de Actie functie knop zit?

ja

b) Hoe vaak heeft u gebruik gemaakt van de Actie functie?

0

c) Vond u de informatie bruikbaar?

Kind is belangrijker dan hokjes van het protocol bij besluiten van vervolgactie. Sociale kaart link geeft officiële sites met kantoor locaties, niet concreet hulp in de buurt.

d) Waarin is dit een toevoeging voor uw werkzaamheden?

Concept wel, uitvoering niet

e) Waarin is dit een belemmering voor uw werkzaamheden?

f) Op-/aanmerkingen? (problemen of verbeterpunten)

Ontwikkeling is misschien niet in hokjes van protocollen te pakken

2.14) Welke handelingen (met de webtool en het gebruik rondom de webtool) vindt u omslachtig, onduidelijk, of nutteloos?

Geboortedatum terug per maand moeten doen

Onderdeel 3: Algemene vragen

In dit onderdeel worden nog een aantal vragen gesteld. Het begint met 3 stellingen (en bijbehorende toelichting), gevolgd met een vraag over hoe u de webtool in toekomstig gebruik ziet. Het eindigt met ruimte voor reacties die u nergens anders kwijt kon (ervaringen, verbeterpunten, vragen, etc.). Probeer de vragen weer zo uitgebreid mogelijk te beantwoorden.

Vragen:

3.1) Stelling: De webtool is makkelijk in het gebruik.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens
Toelichting?

Grafisch ingesteld, makkelijk

Wel graag nog meer met functietoetsen (toetsenbord) kunnen werken (te veel met muis).

3.2) Stelling: De webtool is effectief, het werken met de *D*-screening wordt erdoor verbeterd.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens
Toelichting?

Enige optie. Visueel handig. De black box krijg je niet te zien, beperkt zich tot bruikbare dingen.

3.3) Stelling: De *D*-screening is effectief, het verbetert het resultaat van mijn werk.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens
Toelichting?

In de praktijk sceptisch over screening, zorgkinderen er niet altijd uitgehaald. Ook kinderen eruit waar je (nog) nijs aan wilt doen.

3.4) Stel de *D*-screening (thermometer en *D*-scorediagram) is in het digitaal dossier aanwezig.

a) Zou u deze dagelijks gebruiken?

Als het nut ervan is aangetoond en mij overtuigd heeft

b) Ziet u er een meerwaarde in?

Zo ja, wat is die meerwaarde dan?

Concept: losse items van Wiechen samenvoegen als maat voor ontwikkeling

Zo nee, wat zijn de problemen/drempels waar u tegen aanloopt?

Uitvoering op dit moment, op 3 leeftijden meten los van elkaar. Liever werken met alle gegevens van meerdere leeftijden.

3.5) Overige reacties.

Hartelijk dank voor uw medewerking!

Beste JGZ arts,

De afgelopen periode heeft u gewerkt met de webtool voor het gebruik van de *D*-screening. Het is goed om die ervaring te evalueren. Daarbij wil ik u hier alvast bedanken voor de tijd om dit interview schriftelijk in te vullen.

Het interview bestaat uit 3 onderdelen. Het eerste onderdeel evaluateert vanuit uw werkproces. Het tweede evaluateert op basis van de onderdelen van de webtool. Het derde deel bestaat uit een aantal overige vragen. Elk onderdeel wordt met een korte uitleg ingeleid.

Succes met invullen!

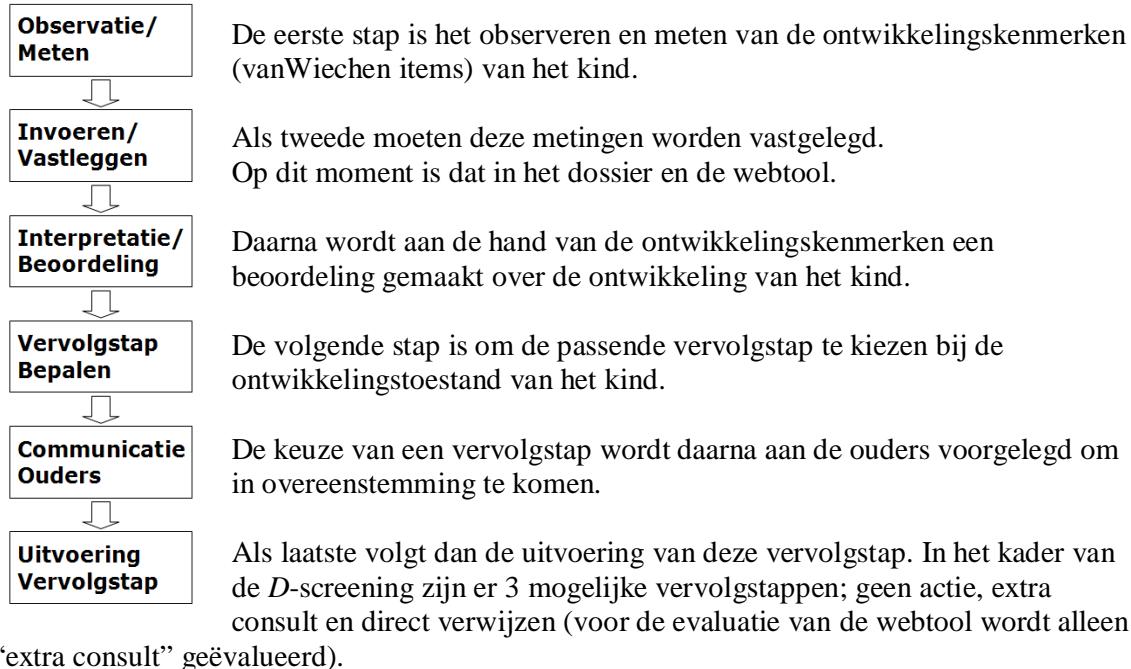
Vriendelijke groet,

Ewoud van Helden

TNO-stagiair

Onderdeel 1: Evaluatie vanuit het werkproces.

Dit onderdeel is opgebouwd aan de hand van het werkproces van de JGZ-arts. De stappen van de JGZ arts zijn als volgt te beschrijven.



Deze 6 stappen worden elk afzonderlijk geëvalueerd. We willen graag weten wat de ervaring was met de webtool in deze stap en of het een positieve of negatieve invloed had. We zijn ook benieuwd wat het effect was voor de betreffende stap (maakte de webtool de stap makkelijker, was er meer of minder tijd nodig voor het uitvoeren van de stap, leidde de webtool tot meer uniform gebruikt/meer volgens protocol, etc.). Op elke vraag volgt een stelling waarbij het gekozen antwoord aangevinkt/ omcirkelt/ onderstreept (indien digitaal) kan worden.

Probeer zo uitgebreid mogelijk te beantwoorden, dit verbetert de evaluatie.

Vragen:

1.6) Ondersteunt de webtool bij het goed observeren en meten van de ontwikkeling van het kind?

Nee

Toelichting?

Je meet dezelfde items, was al routine

Waarin uit zich dat? (bijv. makkelijker, sneller, nauwkeuriger, minder fouten, uniform/protocol)

De webtool ondersteunt bij het goed observeren en meten van de ontwikkeling van het kind.

0 Helemaal mee oneens 0 Mee oneens 0 Noch oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.7) Ondersteunt de webtool bij het goed vastleggen/invoeren van de resultaten van de metingen van de ontwikkeling van het kind?

Toelichting?

Gelijk aan dossier, maar niet echt veel extra werk

Waarin uit zich dat? (bijv. makkelijker, sneller, nauwkeuriger/precies/volledig, minder fouten, uniform/protocol)

De webtool ondersteunt bij het goed vastleggen/invoeren van de resultaten van de metingen van de ontwikkeling van het kind.

0 Helemaal mee oneens 0 Mee oneens 0 Noch oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.8) Ondersteunt de webtool bij het goed interpreteren en beoordelen van de metingen?

Ja, je staat extra stil bij de resultaten

Toelichting?

+Thermometer stemt overeen/bevestigt je interpretatie

-Wel hoger in groen door erfelijkheid terwijl je geen zorgen had voor kind (nog geen probleem geweest)

Waarin uit zich dat? (bijv. makkelijker, sneller, beter/nauwkeuriger, uniform/protocol)

De webtool ondersteunt bij het goed interpreteren en beoordelen van de metingen.

0 Helemaal mee oneens 0 Mee oneens 0 Noch oneens/noch eens 0 Mee eens 0 Helemaal mee eens

Ondersteunt de webtool bij het bepalen van de juiste vervolgstap?

Toelichting?

Eigen protocollen zaten ook in de webtool (leuk dat webtool bevestigt wat je dacht, maar niet noodzakelijk)

Waarin uit zich dat? (bijv. sneller, makkelijker, vaker juiste/beste besluiten/vervolgstappen, uniform/protocol)

De webtool ondersteunt bij het bepalen van de juiste vervolgstap.

0 **Helemaal mee oneens** 0 **Mee oneens** **0 Noch oneens/noch eens** 0 **Mee eens** 0 **Helemaal mee eens**

1.9) Ondersteunt de webtool bij het communiceren over de resultaten van het ontwikkelingsonderzoek van het kind met de ouders?

Ja

Toelichting?

+Thermometer vinden ouders leuk om te zien

Waarin uit zich dat? (bijv. makkelijker, sneller, duidelijker, overtuigender, subtieler/sympathiek, uniform/protocol)

+helpt ouders over de streep trekken

+overtuigender

De webtool ondersteunt bij het goed communiceren over de resultaten van het ontwikkelingsonderzoek van het kind met de ouders.

0 **Helemaal mee oneens** 0 **Mee oneens** 0 **Noch oneens/noch eens** 0 **Mee eens** **0 Helemaal mee eens**

1.6) Ondersteunt de webtool bij het goed uitvoeren van het extra consult?

Toelichting?

Nog niet meegemaakt, verwacht wel dat grafiek helpt ouders bewust te worden van het probleem (visualisatie verbetert dit)

Waarin uit zich dat? (bijv. betere communicatie, makkelijker consult, makkelijker voorbereiden, uniform/protocol)

De webtool ondersteunt bij het goed uitvoeren van het extra consult.

0 **Helemaal mee oneens** 0 **Mee oneens** 0 **Noch oneens/noch eens** **0 Mee eens** 0 **Helemaal mee eens**

Onderdeel 2: Evaluatie vanuit de webtool.

In dit onderdeel wordt de webtool geëvalueerd aan de hand van de onderdelen van de webtool. De webtool bestaat uit een aantal invulvelden en knoppen die in meer of mindere mate hebben bijgedragen aan de uitvoering van de D-screening en de taken van de JGZ arts.

Vragen:

2.1) Sloot de manier van werken met de webtool aan op uw manier van werken in de praktijk, c.q. verstoord de deze manier van werken?

+Stoor niet/sloot aan. Aan ouders vertel je dat je eerst testjes doet, dan zo meteen ook invoeren en kijken wat eruit komt.

-Omdat er extra tijd voor staat plan je andere kinderen verder naar achter. Als kinderen niet komen ben je dus dubbel tijd kwijt. "Productie" gaat achteruit.

-Vooral uitleggen en toestemming vragen kost meer tijd.

-kost meer tijd +/- 5 min.

2.2) Inloggen

Waren hier problemen mee?

Nee

2.3) Algemene gegevens (artsnaam en meetdatum)

Algemeen	
Naam CB Arts:	P de Vries
Meetdatum:	09-06-2010

a) Was dit onderdeel duidelijk?

Ja (naam stond er altijd al, werd op eigen account op pc ingelogd)

b) Op-/aanmerkingen? (problemen of verbeterpunten)

2.4) CB-consult (kindnummer en meetmoment)

CB-Consult	
Kindnummer:	12346
Meetmoment:	<input type="button" value="openen"/> <input type="button" value="sluiten"/>

a) Was dit onderdeel duidelijk?

Ja (consult was meestal op 26/27 maanden waarbij 2 en 2,5 jaar consult gezamenlijk werden gedaan. Verder scoren kan niet omdat 2,5 jaar items er niet in staan)

b) Op-/aanmerkingen? (problemen of verbeterpunten)

2.5) Kind achtergrond

Kind Achtergrond	
Kindnummer:	12345
Lokatie:	Nieuwerkerk
Geslacht:	jongen
Geboortedatum:	16-09-2009
Etniciteit:	autochtoon
Hoogst genoten opleiding vader / moeder:	Havo
Erfelijke belasting:	Geen van bovenstaande
Leeftijd moeder bij bevalling (in jaren):	27
Meerling:	Nee
Apgarscore na 5 minuten:	9

[gegevens wijzigen](#) [opslaan](#)

a) Was dit onderdeel duidelijk?

Ja

b) Was de informatie die u hiervoor nodig had goed beschikbaar?

In dossier of ouders tegenover je

c) Waarin is dit een toevoeging voor uw werkzaamheden?

Bewuster van bijvoorbeeld opleiding ouders of erfelijke belasting (extra onder de aandacht)

d) Waarin is dit een belemmering voor uw werkzaamheden?

Erfelijke belasting lastig te bepalen

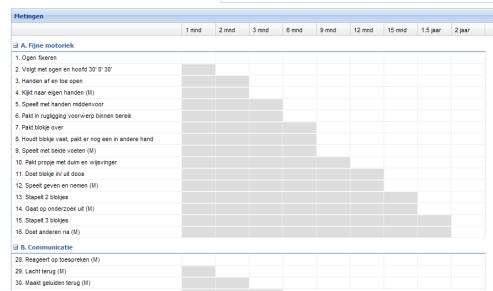
e) Op-/aanmerkingen? (problemen of verbeterpunten)

Erfelijke belasting moet met arts worden doorgenomen wat belangrijk is. Stel kind heeft heupdysplasie in de familie, maar dat heeft verder geen invloed op prestatie kind op gebied van ontwikkeling: de thermometer wordt er wel door beïnvloed.

Onderzoek wat er toe doet/wat van invloed is.

Mee onderverdeling mogelijkheden.

2.6) Metingen (vanWiechenschema)



a) Was dit onderdeel duidelijk?

Ja (net als in dossier)

b) Waarin is dit een toevoeging voor uw werkzaamheden?

nee

c) Waarin is dit een belemmering voor uw werkzaamheden?

Traag, duurde lang voordat menu tevoorschijn kwam en verwerkt was. (zelfde probleem als dat ie niet pakt)

d) Op-/aanmerkingen? (problemen of verbeterpunten)

niet kunnen doorscoren op 2,5 jaar. Zou wel graag willen

2.7) JOI (jeugdarts ontwikkelingsindruck)

Resultaten	
JOI:	NO
Besluit Arts:	Geen vervolgactie

a) Was dit onderdeel duidelijk?

Ja

b) Waarin is dit een toevoeging voor uw werkzaamheden?

Brengt onder woorden wat je vindt

c) Waarin is dit een belemmering voor uw werkzaamheden?

nee

e) Op-/aanmerkingen? (problemen of verbeterpunten)

2.8) Thermometer



a) Was dit onderdeel duidelijk?

ja

b) Hoe heeft u de thermometer gebruikt?

Aan ouders laten zien hoe in kind zit met ontwikkeling
Wet niet meegenomen maar bevestigde besluit

c) Wat vindt u van de informatie die de thermometer geeft?

Voor ouders uitleg door visualisatie

d) Heeft de thermometer geleid tot andere/betere besluiten (of andere besluitvorming)?

nee

e) Waarin is dit een toevoeging voor uw werkzaamheden (specifiek ook naar ouders toe)?

Ouders beter uitleggen wat je bedoelt

Ouders laatste zetje in de rug geven (wordt verwacht, nog geen positieve gevallen gehad)

f) Waarin is dit een belemmering voor uw werkzaamheden?

Dat de thermometer anders kan uitkomen dan je hoopt/eigen oordeel is geen probleem. Je legt aan ouders uit dat de thermometer bepaalde dingen meeneemt, maar dat andere dingen aandacht nodig kunnen hebben.

g) Op-/aanmerkingen? (problemen of verbeterpunten)

(gehoord) dat op de rand oranje/groen lastig is.

2.9) Besluit

Besluit Arts:

Geen vervolgactie

a) Was dit onderdeel duidelijk?

ja

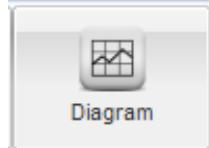
b) Heeft de webtool geleid tot andere besluiten (of andere besluitvorming)? Zo ja, welke?

Nee (meer bevestiging)

c) Op-/aanmerkingen? (problemen of verbeterpunten)

(eigenlijk nooit oneens met webtool, veel kinderen deden het goed, thermometer altijd groen, dus geen reden om oneens te zijn)

2.10) Diagram



a) Was dit onderdeel duidelijk?

Ja (idee was duidelijk)

b) Heeft u gebruik gemaakt van het diagram? En zo ja: Hoe?

nee

c) Was het duidelijk wat de informatie betekende/hoe die geïnterpreteerd moest worden?

Ja (door training)

d) Wat vindt u van de informatie die het diagram geeft?

Goed dat je ontwikkeling visualiseert. Afhankelijk van opleidingsniveau zeggen + of – meer of minder niet zoveel aan ouders. Plaatje makkelijk te begrijpen en het zegt ze ook was.

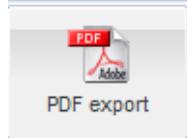
e) Waarin is dit een toevoeging voor uw werkzaamheden (specifiek ook naar ouders toe)?

Zie d

f) Waarin is dit een belemmering voor uw werkzaamheden?

g) Op-/aanmerkingen? (problemen of verbeterpunten)

2.11) PDF functie



a) Was het duidelijk welke functie deze knop heeft?

ja

b) Hoe vaak heeft u gebruik gemaakt van de PDF functie?

nee

c) Wat vindt u van de informatie die de PDF functie geeft?

nee

d) Op-/aanmerkingen? (problemen of verbeterpunten)

2.12) Help functie



a) Was het duidelijk wat er achter de Help functie knop zit?

ja

b) Hoe vaak heeft u gebruik gemaakt van de Help functie?

In het begin 1 of 2 keer uit nieuwsgierigheid wat het was/erin stond

c) Vond u de informatie bruikbaar (stond alles erin)?

Ja (achtergrond kernmerken)

d) Was de help functie voldoende of had u liever meer ondersteuning gehad? Wie/hoe had dat eruit moeten zien?

Ja, geen extra ondersteuning

e) Waarin is dit een toevoeging voor uw werkzaamheden?

niet

f) Waarin is dit een belemmering voor uw werkzaamheden?

niet

g) Op-/aanmerkingen? (problemen of verbeterpunten)

prettig dat ie er was (voorkomt constant bellen over hoe of wat)

prettig gevoel dat ie achter de hand is.

2.13) Actie functie



a) Was het duidelijk wat er achter de Actie functie knop zit?

Niet eens gezien (niet duidelijk wat het deed)

b) Hoe vaak heeft u gebruik gemaakt van de Actie functie?

0

c) Vond u de informatie bruikbaar?

d) Waarin is dit een toevoeging voor uw werkzaamheden?

e) Waarin is dit een belemmering voor uw werkzaamheden?

f) Op-/aanmerkingen? (problemen of verbeterpunten)

mag er wel uit, je hebt al protocollen hiervoor.

2.14) Welke handelingen (met de webtool en het gebruik rondom de webtool) vindt u omslachtig, onduidelijk, of nutteloos?

Geen

Onderdeel 3: Algemene vragen

In dit onderdeel worden nog een aantal vragen gesteld. Het begint met 3 stellingen (en bijbehorende toelichting), gevolgd met een vraag over hoe u de webtool in toekomstig gebruik ziet. Het eindigt met ruimte voor reacties die u nergens anders kwijt kon (ervaringen, verbeterpunten, vragen, etc.). Probeer de vragen weer zo uitgebreid mogelijk te beantwoorden.

Vragen:

3.1) Stelling: De webtool is makkelijk in het gebruik.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens
Toelichting?

Lang wachten/traagheid leverde wel frustratie op
Prima in gebruik
Sprak voor zich
Basic dingen voor 1 interpretatie mogelijk
Uniform invullen

3.2) Stelling: De webtool is effectief, het werken met de *D*-screening wordt erdoor verbeterd.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens
Toelichting?

Visualiseren naar ouders toe
Functies om D-screening uit te voeren zitten erin

3.3) Stelling: De *D*-screening is effectief, het verbetert het resultaat van mijn werk.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens
Toelichting?

Heeft niet in beslissingen beïnvloed

3.4) Stel de *D*-screening (thermometer en *D*-scorediagram) is in het digitaal dossier aanwezig.

a) Zou u deze dagelijks gebruiken?

nee

b) Ziet u er een meerwaarde in?

Zo ja, wat is die meerwaarde dan?

Wel in afwijkende gevallen naar ouders toe als ondersteuning, niet standaard maar in twijfelgevallen

Zo nee, wat zijn de problemen/drempels waar u tegen aanloopt?

3.5) Overige reacties.

Informeren van de ouders gaat veel tijd in zitten: folder waardoor ze inlezen/ geen toestemming hoeven vragen in toekomst is beter

Door D-screening lopen ze (JGZ) wel achterstand op

Kost in toekomst ook 5min extra.

Goed dat er geëvalueerd wordt.

Hartelijk dank voor uw medewerking!

Beste JGZ arts,

De afgelopen periode heeft u gewerkt met de webtool voor het gebruik van de *D*-screening. Het is goed om die ervaring te evalueren. Daarbij wil ik u hier alvast bedanken voor de tijd om dit interview schriftelijk in te vullen.

Het interview bestaat uit 3 onderdelen. Het eerste onderdeel evaluateert vanuit uw werkproces. Het tweede evaluateert op basis van de onderdelen van de webtool. Het derde deel bestaat uit een aantal overige vragen. Elk onderdeel wordt met een korte uitleg ingeleid.

Succes met invullen!

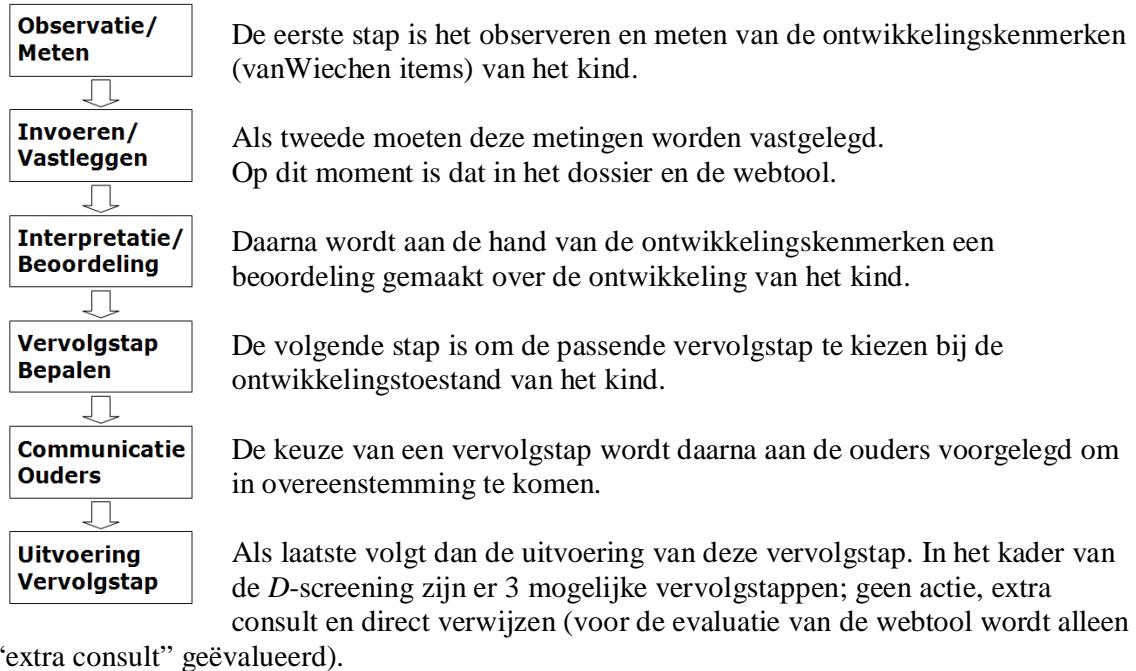
Vriendelijke groet,

Ewoud van Helden

TNO-stagiair

Onderdeel 1: Evaluatie vanuit het werkproces.

Dit onderdeel is opgebouwd aan de hand van het werkproces van de JGZ-arts. De stappen van de JGZ arts zijn als volgt te beschrijven.



Deze 6 stappen worden elk afzonderlijk geëvalueerd. We willen graag weten wat de ervaring was met de webtool in deze stap en of het een positieve of negatieve invloed had. We zijn ook benieuwd wat het effect was voor de betreffende stap (maakte de webtool de stap makkelijker, was er meer of minder tijd nodig voor het uitvoeren van de stap, leidde de webtool tot meer uniform gebruikt/meer volgens protocol, etc.). Op elke vraag volgt een stelling waarbij het gekozen antwoord aangevinkt/ omcirkelt/ onderstreept (indien digitaal) kan worden.

Probeer zo uitgebreid mogelijk te beantwoorden, dit verbetert de evaluatie.

Vragen:

- 1.10) Ondersteunt de webtool bij het goed observeren en meten van de ontwikkeling van het kind?
ja

Toelichting?

Gericht op belangrijke dingen per leeftijd, focus is belangrijk

Gewend zoals het dossier

Algemeen helpt het wel een beetje, niet heel veel.

Waarin uit zich dat? (bijv. makkelijker, sneller, nauwkeuriger, minder fouten, uniform/protocol)

De webtool ondersteunt bij het goed observeren en meten van de ontwikkeling van het kind.

0 Helemaal mee oneens 0 Mee oneens 0 Noch oneens/noch eens 0 Mee eens 0 Helemaal mee eens

- 1.11) Ondersteunt de webtool bij het goed vastleggen/invoeren van de resultaten van de metingen van de ontwikkeling van het kind?

nee

Toelichting?

PlusSEN en minnen nu ook in het dossier, gewoon hetzelfde

Computer gebruik wel leuker en duidelijk dan dossier (leesbaar voor iedereen)

Waarin uit zich dat? (bijv. makkelijker, sneller, nauwkeuriger/precies/volledig, minder fouten, uniform/protocol)

De webtool ondersteunt bij het goed vastleggen/invoeren van de resultaten van de metingen van de ontwikkeling van het kind.

0 Helemaal mee oneens 0 Mee oneens 0 Noch oneens/noch eens 0 Mee eens 0 Helemaal mee eens

- 1.12) Ondersteunt de webtool bij het goed interpreteren en beoordelen van de metingen?

Toelichting?

Nog maar net met webtool bezig, lastig om te zeggen o webtool helpt.

Alles was groen.

(1x dat kind normaal was en thermometer geel, bleek dat achtergrond gegevens meerling was, terwijl eenling moest zijn. Na aanpassing, was thermometer weer groen)

Soms op verkeerde been gezet.

Waarin uit zich dat? (bijv. makkelijker, sneller, beter/nauwkeuriger, uniform/protocol)

(2x ondanks groene thermometer wel terug laten komen/vervolg)

De webtool ondersteunt bij het goed interpreteren en beoordelen van de metingen.

0 Helemaal mee oneens 0 Mee oneens 0 Noch oneens/noch eens 0 Mee eens 0 Helemaal mee eens

- 1.13) Ondersteunt de webtool bij het bepalen van de juiste vervolgstap?

soms

Toelichting?

Groen betekent geen vervolgstap, maar wel eens vervolgstap moeten doen

Webtool helpt niet bij kiezen welke stap (zegt niet wat je moet doen)

Waarin uit zich dat? (bijv. sneller, makkelijker, vaker juiste/beste besluiten/vervolgstappen, uniform/protocol)

De webtool ondersteunt bij het bepalen van de juiste vervolgstap.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.14) Ondersteunt de webtool bij het communiceren over de resultaten van het ontwikkelingsonderzoek van het kind met de ouders?

Toelichting?

Als kind normaal is, is het groen een bevestiging voor de ouders.

Ook visueel

Als toch geel blijkt te zijn: uitleggen dat thermometer vWiechen items+achtergrond is. Wel langer uitleg nodig bij geel.

Als arts en thermometer het eens zijn, dan goed, maar als arts en thermometer oneens zijn niet goed (meer uitleg nodig)

Waarin uit zich dat? (bijv. makkelijker, sneller, duidelijker, overtuigender, subtieler/sympathiek, uniform/protocol)

De webtool ondersteunt bij het goed communiceren over de resultaten van het ontwikkelingsonderzoek van het kind met de ouders.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

1.6) Ondersteunt de webtool bij het goed uitvoeren van het extra consult?

Toelichting?

Diagram vaak niet aan ouders laten zien, alleen als het echt motiverend/overtuigend/visueel is.

Korte tijd, dus lastig iets over te zeggen.

1x groene thermometer maar toch kind terug, diagram was niet heel apart/bijzonder.

Waarin uit zich dat? (bijv. betere communicatie, makkelijker consult, makkelijker voorbereiden, uniform/protocol)

De webtool ondersteunt bij het goed uitvoeren van het extra consult.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

Onderdeel 2: Evaluatie vanuit de webtool.

In dit onderdeel wordt de webtool geëvalueerd aan de hand van de onderdelen van de webtool. De webtool bestaat uit een aantal invulvelden en knoppen die in meer of mindere mate hebben bijgedragen aan de uitvoering van de D-screening en de taken van de JGZ arts.

Vragen:

2.1) Sloot de manier van werken met de webtool aan op uw manier van werken in de praktijk, c.q. verstoordde het deze manier van werken?

Past prima.

Eerst consult, daarna met ouders invoeren.

Kind onderzoeken-screenen-bespreken.

2.2) Inloggen

Waren hier problemen mee?

nee

2.3) Algemene gegevens (artsnaam en meetdatum)

Algemeen	
Naam CB Arts:	P de Vries
Meetdatum:	09-06-2010

a) Was dit onderdeel duidelijk?

ja

b) Op-/aanmerkingen? (problemen of verbeterpunten)

-

2.4) CB-consult (kindnummer en meetmoment)

CB-Consult	
Kindnummer:	12345
Meetmoment:	<input type="button" value="▼"/>
<input type="button" value="openen"/> <input type="button" value="sluiten"/>	

a) Was dit onderdeel duidelijk?

ja

b) Op-/aanmerkingen? (problemen of verbeterpunten)

Kind nummer is niet aan te passen.

2.5) Kind achtergrond

Kind Achtergrond

Kindnummer:	12345
Lokatie:	Nieuwerkerk
Geslacht:	jongen
Geboortedatum:	16-09-2009
Etniciteit:	autochtoon
Hoogst genoten opleiding vader / moeder:	Havo
Erfelijke belasting:	Geen van bovenstaande
Leeftijd moeder bij bevalling (in jaren):	27
Meerling:	Nee
Apgarscore na 5 minuten:	9

[gegevens wijzigen](#) [Opslaan...](#)

a) Was dit onderdeel duidelijk?

ja

b) Was de informatie die u hiervoor nodig had goed beschikbaar?

ja

c) Waarin is dit een toevoeging voor uw werkzaamheden?

Nee, keek al in dossier (rekening houden met situatie)

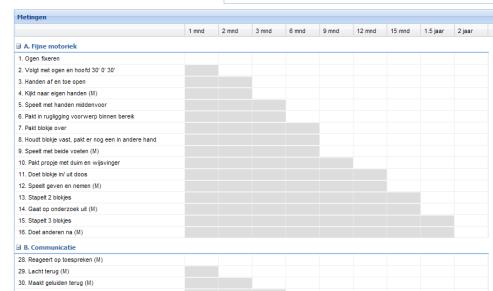
d) Waarin is dit een belemmering voor uw werkzaamheden?

nee

e) Op-/aanmerkingen? (problemen of verbeterpunten)

-

2.6) Metingen (vanWiechenschema)



a) Was dit onderdeel duidelijk?

Ja (zowel doorscoren als echte alleen + of- als M niet mag)

b) Waarin is dit een toevoeging voor uw werkzaamheden?

Zelfde, weet je al uit je hoofd

c) Waarin is dit een belemmering voor uw werkzaamheden?

nee

d) Op-/aanmerkingen? (problemen of verbeterpunten)

precies als dossier, goed

2.7) JOI (jeugdarts ontwikkelingsindruck)

Resultaten	
JOI:	NO
Besluit Arts:	Geen vervolgactie

a) Was dit onderdeel duidelijk?

Ja, compleet

b) Waarin is dit een toevoeging voor uw werkzaamheden?

Niet echt

c) Waarin is dit een belemmering voor uw werkzaamheden?

nee

e) Op-/aanmerkingen? (problemen of verbeterpunten)

-

2.8) Thermometer



a) Was dit onderdeel duidelijk?

ja

b) Hoe heeft u de thermometer gebruikt?

Nieuwsgierig, even kijken wat de D-screening zeg (spannend)

c) Wat vindt u van de informatie die de thermometer geeft?

Goed: geel opletten=extra aandacht. Wijst op situatie van extra aandacht nodig is.

d) Heeft de thermometer geleid tot andere/betere besluiten (of andere besluitvorming)?

nee

e) Waarin is dit een toevoeging voor uw werkzaamheden (specifiek ook naar ouders toe)?

Visueel voor de ouders, groen dan ouders blij

f) Waarin is dit een belemmering voor uw werkzaamheden?

nee

g) Op-/aanmerkingen? (problemen of verbeterpunten)

duidelijk

2.9) Besluit

Besluit Arts:	Geen vervolgactie
---------------	-------------------

a) Was dit onderdeel duidelijk?

ja

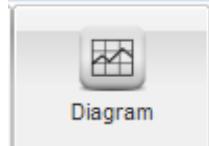
b) Heeft de webtool geleid tot andere besluiten (of andere besluitvorming)? Zo ja, welke?

nee

c) Op-/aanmerkingen? (problemen of verbeterpunten)

-

2.10) Diagram



a) Was dit onderdeel duidelijk?

ja

b) Heeft u gebruik gemaakt van het diagram? En zo ja: Hoe?

1x (extra consult + asq, ook diagram gekeken => viel mee, laten zien, was normaal dus bevestiging voor ouders dat het ook best ging)

c) Was het duidelijk wat de informatie betekende/hoe die geïnterpreteerd moest worden?

ja

d) Wat vindt u van de informatie die het diagram geeft?

Andere manier alle informatie bij elkaar laten zien

e) Waarin is dit een toevoeging voor uw werkzaamheden (specifiek ook naar ouders toe)?

Nee (visuele) thermometer meer (ouders kunnen minder met grafiek)

f) Waarin is dit een belemmering voor uw werkzaamheden?

nee

g) Op-/aanmerkingen? (problemen of verbeterpunten)

-

2.11) PDF functie



a) Was het duidelijk welke functie deze knop heeft?

ja

b) Hoe vaak heeft u gebruik gemaakt van de PDF functie?

nee

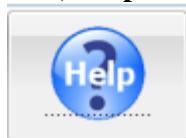
c) Wat vindt u van de informatie die de PDF functie geeft?

Voegt niet iets toe/ook geen bezwaar

d) Op-/aanmerkingen? (problemen of verbeterpunten)

-

2.12) Help functie



a) Was het duidelijk wat er achter de Help functie knop zit?

Nooit gekken, uit map alles al gelezen

b) Hoe vaak heeft u gebruik gemaakt van de Help functie?

nee

c) Vond u de informatie bruikbaar (stond alles erin)?

Overbodig, alles stond erin

d) Was de help functie voldoende of had u liever meer ondersteuning gehad? Wie/hoe had dat eruit moeten zien?

duidelijk, map was voldoende

e) Waarin is dit een toevoeging voor uw werkzaamheden?

nee

f) Waarin is dit een belemmering voor uw werkzaamheden?

nee

g) Op-/aanmerkingen? (problemen of verbeterpunten)

-

2.13) Actie functie



a) Was het duidelijk wat er achter de Actie functie knop zit?

Net als help, wel duidelijk geschreven

b) Hoe vaak heeft u gebruik gemaakt van de Actie functie?

nee

c) Vond u de informatie bruikbaar?

Wel handig wat je moet doen

d) Waarin is dit een toevoeging voor uw werkzaamheden?

Mee, wel mooi duidelijk wat je moet doen

e) Waarin is dit een belemmering voor uw werkzaamheden?

nee

f) Op-/aanmerkingen? (problemen of verbeterpunten)

2.14) Welke handelingen (met de webtool en het gebruik rondom de webtool) vindt u omslachtig, onduidelijk, of nutteloos?

Nee, geen extra overbodige dingen

Onderdeel 3: Algemene vragen

In dit onderdeel worden nog een aantal vragen gesteld. Het begint met 3 stellingen (en bijbehorende toelichting), gevolgd met een vraag over hoe u de webtool in toekomstig gebruik ziet. Het eindigt met ruimte voor reacties die u nergens anders kwijt kon (ervaringen, verbeterpunten, vragen, etc.). Probeer de vragen weer zo uitgebreid mogelijk te beantwoorden.

Vragen:

3.1) Stelling: De webtool is makkelijk in het gebruik.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

Toelichting?

Geen probleem, behalve dat kindnummer niet gewijzigd kon worden

3.2) Stelling: De webtool is effectief, het werken met de *D*-screening wordt erdoor verbeterd.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

Toelichting?

Belangrijke gegevens invoeren, gegevens komen eruit en aan de hand daarvan ontwikkeling en achtergrond

3.3) Stelling: De *D*-screening is effectief, het verbetert het resultaat van mijn werk.

0 Helemaal mee oneens 0 Mee oneens 0 Nog oneens/noch eens 0 Mee eens 0 Helemaal mee eens

Toelichting?

Nog geen verbetering tot nu toe, zelfde beslissing

3.4) Stel de *D*-screening (thermometer en *D*-scorediagram) is in het digitaal dossier aanwezig.

a) Zou u deze dagelijks gebruiken?

Durft nog niet te zeggen, wel even kijken wat de thermometer zegt. Als alles goed en toch geel, dan denk je toch o... beter kijken.
nieuwsgierig

b) Ziet u er een meerwaarde in?

Zo ja, wat is die meerwaarde dan?

Zo nee, wat zijn de problemen/drempels waar u tegen aanloopt?

Tot nu toe niet, korte tijd gebruikt en nog geen resultaat gezien. Ook veel gezonde kinderen.

3.5) Overige reacties.

Dossier was prima, maar webtool duidelijk/overzicht.

Wel plezier met *D*-screening

Digitaal fijner dan papier (dingen raken niet kwijt, iedereen kan het lezen, altijd beschikbaar)

Nadeel is meer tijd, maar misschien alleen in het begin.

Over algemeen thermometer wel, ouders meer tevreden/overtuigd.

Hartelijk dank voor uw medewerking!