

Marking up the right tree: understanding the customer process at UWV

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Abstract. The UWV is the Dutch government agency that is responsible for the distribution of unemployment benefits and for the assistance of unemployed in finding a new job. UWV wants to improve the customer journey. This paper analyses the use of the UWV website and call center, using process mining techniques. This analysis reveals different patterns of use, related to customer profiles. A special tool was developed to match the customer process to the hierarchical structure of the customer interface. The results suggest several directions for improvement.

Keywords: process mining, data mining, big data, organizational analysis, process analysis, hierarchical structure, UWV, unemployment benefits.

1 Introduction

1.1 UWV wants to improve the customer journey and save on costly contacts

UWV is the Dutch government agency that is responsible for the distribution of unemployment benefits (and other benefits that are no subject of this study) and for the assistance of unemployed in finding a new job. UWV wants to improve the customer journey.

1.2 Business Process Intelligence Challenge 2016 with Public Data from UWV

As part of the annual conference in the field of Business Process Management, an International Workshop on Business Process Intelligence (BPI'16) is organized. The organizers of this workshop also organize an international contest: the Business Process Intelligence Challenge 2016 [1]. For the 2016-edition of this contest, the case of the customer journey of people who apply for WW-benefits in the Netherlands is offered to contestants. The analysis in this paper was based on the data of website visits and contacts with the call center that was provided for this contest. All activities were logged by the computer system. This log data was made publicly available for the contest [2].

1.3 This Paper Describes Different Types of Use and Identifies Leads for Improvements

This paper aims to identify the possibilities for improvement with regard to the customer journey, that may be distilled from a process log and answer the questions of UWV. UWV is interested in answers to the following questions: [1]:

1. Are there clear distinct usage patterns of the website to be recognized? In particular, insights into the way various customer demographics use the website and the Werkmap pages of the website are of interest.
2. Do the usage patterns of the website by customers change over time? Do customers visit different pages when they start using the website versus when they have been using the website for some time? How does the usage change over time?
3. When is there a transition from the website to a more expensive channel, such as sending a Werkmap message, contacting the call center or filing a complaint? Is there a way to predict and possibly prevent these transitions?
4. Does the behavior of the customers change after they have send a Werkmap message, made a phone call or filed a complaint? Are customers more likely to use these channels again after they have used them for the first time? What is the customer behavior on the site after customers have been in contact through the Werkmap or by phone?
5. Is there any specific customer behavior that directly leads to complaints?
6. Finally, we challenge the creative minds, to surprise UWV with new insights on the provided data to help improve the experiences of our customers when using the website?

1.4 Approach

The analysis in this paper focusses solely on the logged data about customer contacts through website and call center. The quality of the information provided on the website or through the call center was not investigated. Process mining techniques should provide insight in the flow through the process. The approach is chosen to fit the huge size of the dataset. In order to be able to handle the data the files were first cleaned and then split up into logical sets, matching the different customer groups that UWV wants to see analyzed and compared (Figure 1).

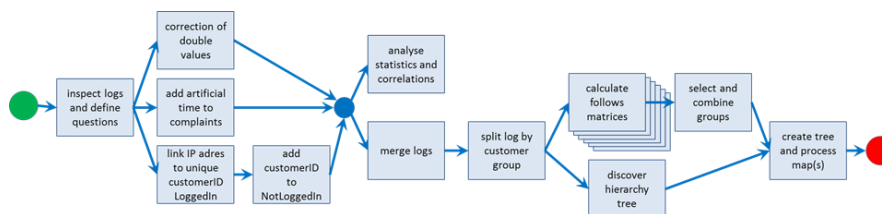


Figure 1 Process of analyzing the information

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This case study is also used to test a new Enterprise Tree Mapper that allows to map a process onto a hierarchical tree structure.

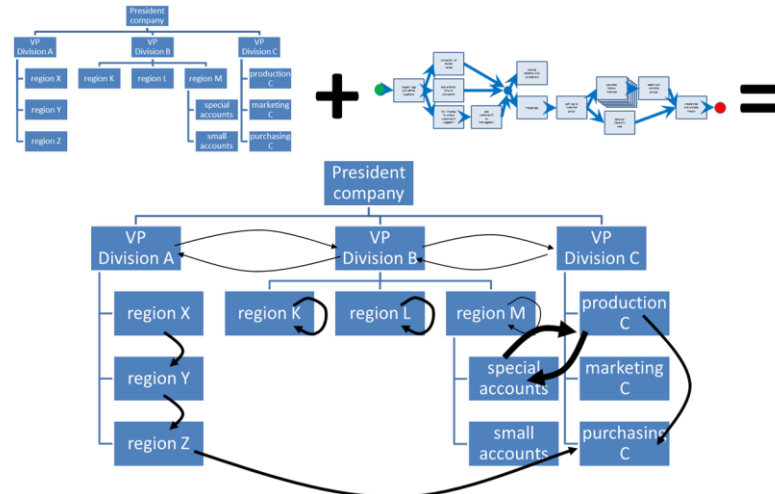


Figure 2 Tree structure + process map = Enterprise Tree Mapper

1.5 For Contest Purposes Only

This paper serves only as a contribution to the Business Process Intelligence Challenge 2016. No formal relationship exists between the author or his company and UWV. The analysis provided in this paper may therefore not formally be regarded as an advice or consult.

The type of numeric analysis presented in this paper, can only be the starting point of further investigation and is not meant to reach final conclusions. A proper analysis of the processes does require further interpretation of the results with the members of the organization involved.

This paper is written for a target audience of management of UWV rather than academics in the field of process mining.

2 Unemployment Benefits at the Dutch UWV

This chapter describes the context of the processes that are to be analyzed. In The Netherlands employees are entitled to benefits from a state owned, independent fund when they lose their job.

2.1 Financial Support and Help to Find a New job

UWV is the merger of two former organizations that were responsible for respectively financial support of unemployed and the brokers function on the labor

market. These two functions are now combined. The unemployed gets help in finding a new job and, in doing so, UWV also checks if sufficient efforts are made to get another job. The support ranges from scouting and preselecting vacancies to offering information on education and possibilities for career changes.

2.2 Efficiency through Digitization

In order to gain efficiency and reduce cost, UWV has digitized the major part of the benefits process and all support. Customers should be able to find all information on the UWV website. An unemployment benefit (known as WW) can be applied for at the website. Customers can also provide all required information on obligatory efforts to find a new job, through a part of the website called the “werkmap”. Through the werkmap they can also send messages to UWV employees when they want additional information. Customers can also phone the call center. It is obvious that messages and particularly phone calls are more expensive than information that is retrieved from the website and should be avoided. A good web service may help achieving that.

It is a challenge to keep customer happiness at a high level when relying on web services. Some people feel that UWV has digitized red tape, only to deliver the same bureaucracy at lower cost. The loss of contact with qualified staff has even led to a newspaper article with the title: “Lost in the digital maze.” [3]

2.3 Customers Come Involuntarily

According to management theory [4] UWV is a “task-organization” because it is a government agency and the “customers” are not free to choose by which agency they will be served, just like citizens are not free to choose by which police force they will be stopped on the road. This means that UWV does not have customers in sense that a commercial company has customers. The UWV wants as little customers as possible and their task is to get rid of these customers as soon as possible, notably by helping them find a job. Nevertheless, a task-organization can pursue a friendly treatment of all who have to use their services.

2.4 Very Hard to Get Happy Customers

Marketing of services theory [5] tells us that customers are happy about a service when they are happy about their own achievement. From that perspective, improving the customer journey is a huge challenge. People who lose their job are mostly not very happy because they usually have already experienced a period of uncertainty and stress until the final moment of losing the job. Moreover, people derive a lot of self-esteem from their job. Losing a job is a traumatic experience, causing people to question who they are and what their capabilities are. Even if the UWV did a perfect job, it would still be very difficult to have happy customers because they are unhappy about themselves.

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UWV-bashing has become a popular activity amongst customers, that is facilitated by social media like Twitter (@UWVreselijk, meaning UWVHorrible) and websites devoted to complaints about UWV. The fact that people do not choose to use the services of UWV, but feel condemned to these services, is fertile soil for growing complaints.

3 Dataset Represents an Unstructured Process

For the purpose of the challenge 5 files were made available by UWV:

1. Complaints, 289 rows
2. Questions, 123k rows
3. Messages, 66 k rows
4. ClicksLoggedIn, 7 million rows
5. ClicksNotLoggedIn, 9,3 million rows

The logs contain the data of different sets of customers. As usual, there are several issues with the raw data. 763 customers asked one or more questions (total 4521 questions) but do not show in the ClicksLoggedIn file so their behavior can not be analyzed. There is one customer (1881904) with 2 complaints that did not log in. The messages all appeared twice in the file, so half of them were deleted.

The page visits by people that are not logged in, are not labeled with a CustomerID. The log does give an IP-address of the visitor. Some IP-addresses are used by several people (e.g. from a school, internet cafe, library, spouses) and can not be linked to a unique customer. All IP-addresses that were used by only one CustomerID in the loggedIn-file, were used. This results in 5,6 million clicks with an IP-address that can be linked to a CustomerID. Quite remarkable is that some webpages that appear in this file, should not be accessible without logging in.

Merging all data together gives us a log with a total of 26k customers. This is only a small portion of the total number of unemployed. According to the national statistics office CBS [6] in 2015 583.740 people got a new WW-benefit and 578.700 lost their WW-benefit, about half of these people because they found a new job. By the end of December 2015 there were 445.880 people receiving WW-benefits [7].

It is unclear how the subset was selected by the UWV. According to the description provided, “the data is focused on customers in the WW (unemployment benefits) process” (meaning that other types of benefits are not included). The traces have no activities that mark start or end of the trace. Many traces seem incomplete. Of the 26k customers in the log files, only 6413 finish the application process for WW-benefits within the timeframe of the log. If the customers have to use the Werkmap to register obligatory activities, one would expect regular visits. Many customers do not show this pattern in their log and have only a few activities. For instance, customer 100784 has 46 events (excl. start/end). She logs in at 10-10-2015 (looking for vacancies) and at 23-12-2015 and asks a question during the session at 23-12 (When is/are transferred my unemployment benefits?) and goes on filling in tasks and job applications in the Werkmap. The activities for WW-application are missing. It is unlikely that she will have applied before the start date of the log and never have

visited the site until October. This kind of traces do not show the pattern of regular visits that one would expect for traces starting before the start date of the log or ending after the end date of the log.

The process itself is not structured. Customers are free to browse the website and phone the call center, even if they have no intention to apply for WW. Therefore all traces are used for the analysis.

4 Messages are the communication channel of choice for many customers

Messages are a well-used channel of communication. 66k messages were logged, an average of about 2,5 messages per person. Messages are mainly send during office hours. Apparently people use messages because of their convenience and not as a 24/7 alternative after closing of the call center. There are hardly any differences in the timing of messages for different customer groups (see Figure 3)

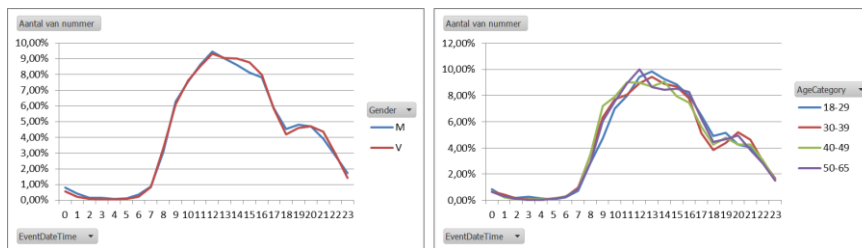


Figure 3 Most messages are send during office hours

There are 2 channels for messages that were only identified as channel 1 and channel 2. One third of the messages come through channel 2. Older people have a slightly stronger preference for channel 1 (see appendix **Table 6**).

We will later see how messages and phone calls are each other's substitutes.

It is hard to analyze the messages properly, since the content of the messages is not in the log. Therefore, a causal analysis was conducted. A database was created with 26.647 customers and 50 dimensions (see appendix). The dimensions include customer characteristics, but also trace characteristics and significant events like application of benefits, use of vacancy database, intensity of use of the website etc. These dimensions were used to try to explain the use of messages, phone calls and complaints with the IBM web service Watson.

Watson could not explain the occurrence of questions, and for the occurrence of messages only limited explanation was found in the increased use of:

- (a) `werk_nl/werknemer/mijn_werkmap/postvak/mijn_berichten` (very obvious, but comforting not to miss this factor);
- (b) `werk_nl/werknemer/mijn_werkmap/postvak/mijn_documenten` (Figure 4).

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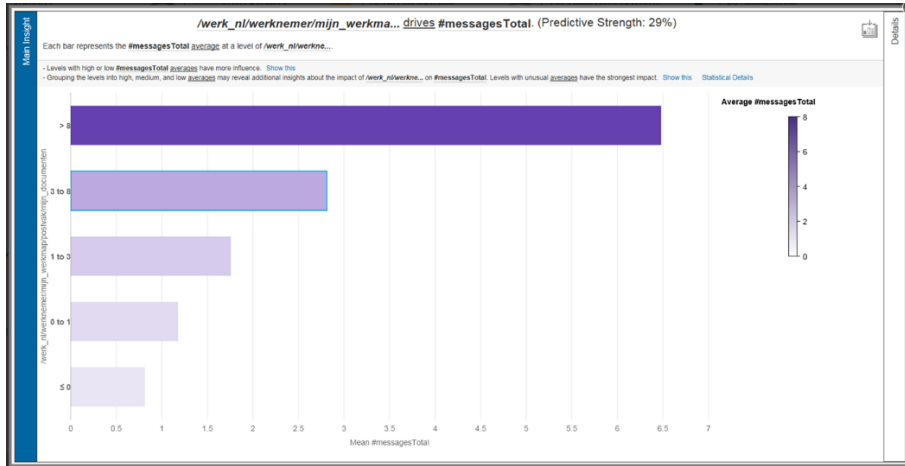


Figure 4 Use of messages increases with the use of postvak/mijn_documenten Analysis with Watson

5 Call center questions and messages are substitutes, but replacing phone calls may be difficult

Questions provide the customers a possibility for direct contact. The majority of customers use this possibility. A total of 123403 questions were asked in 77615 phone calls. 47734 calls handled only one question. In this chapter we will analyze the differences in use, and see if there are possibilities to reduce the number of phone calls in order to reduce the cost of this expensive channel.

5.1 More phone calls from older people

The costs of the call center are mainly caused by older customers. An average customer age 50-65 takes 43% more time than customers 18-29 because they make more phone calls and take more time per question. Older people are more inclined to call and make more phone calls per customer that uses the call center.

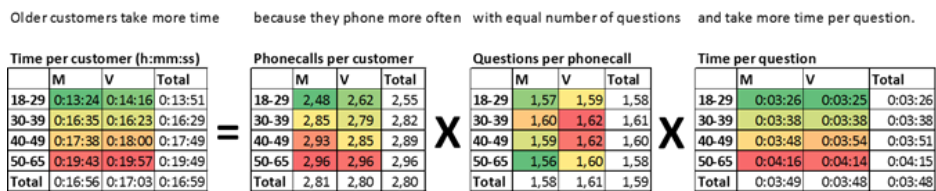


Figure 5 The questions of older customers take more time

5.2 Many questions can easily be avoided by sending a mail

In the log we find 123.403 questions, mainly from the Theme WN WW (116.268 questions), and the subthemes Income form declaration (26.432) and Payment (16.405+1.523=17.928).

When we look at the individual questions that people ask, the number one question is: “When will I get paid?” There are several variants of this question. Other related questions are about “how much?” and “how long?” This kind of questions might be avoided by proactively sending customers an E-mail or SMS text message with the payment date or the status of their application, very similar to the regular status updates you get after ordering at a web shop. A number of questions on the income declaration form (“Where do I find...”) might be avoided by sending (a link to) the form by mail and Werkmap message at the moment that the form is needed.

Questions can also be avoided by having clear rules and procedures. This is partially beyond the direct influence of the UWV. A single definition of income or wage might for instance avoid up to 4170 questions on what amount to use when filling in the forms. At this moment there are different definitions and amounts that are used as basis for taxes, subsidies, pensions and benefits.

Table 1. Complexity of the definition of income leads to questions

Question	Number
How is the level of my daily wage?	1956
What should I include on my Income Problem?	1264
Filling: I can not find my payslip my SV wages. What should I fill?	950
Total	4170

5.3 Questions and messages are substitutes

Avoiding questions is obviously better than replacing them by messages, but answering questions through the messages channel is cheaper than answering them through the call center. In **Figure 6** all customers were plotted by the number of phone calls and the number of messages. This results in a diagonal pattern that shows that messages can be a substitute for questions. In the following paragraphs we will see how different groups of users communicate through these two channels.

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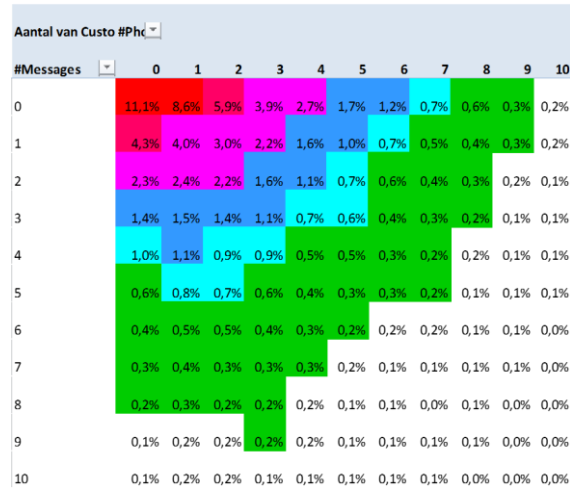


Figure 6 Number of customers plotted by their number of phone calls and messages. The diagonal pattern suggests that questions and messages are substitutes. 93.4% of all customers covered in 10 x 10 matrix.

5.4 Young people do not prefer messages to phone calls

The diagonal pattern suggests that messages are a substitute for phone calls. When comparing young versus old customers, one would expect to see relatively more youngsters using messages rather than the phone, resulting in a steeper diagonal line. Young people are expected to use modern digital communication channels while older people would use the phone.

It is surprising to see that the opposite is true. Young people send less messages and communicate less in general. They often prefer the phone to messages.

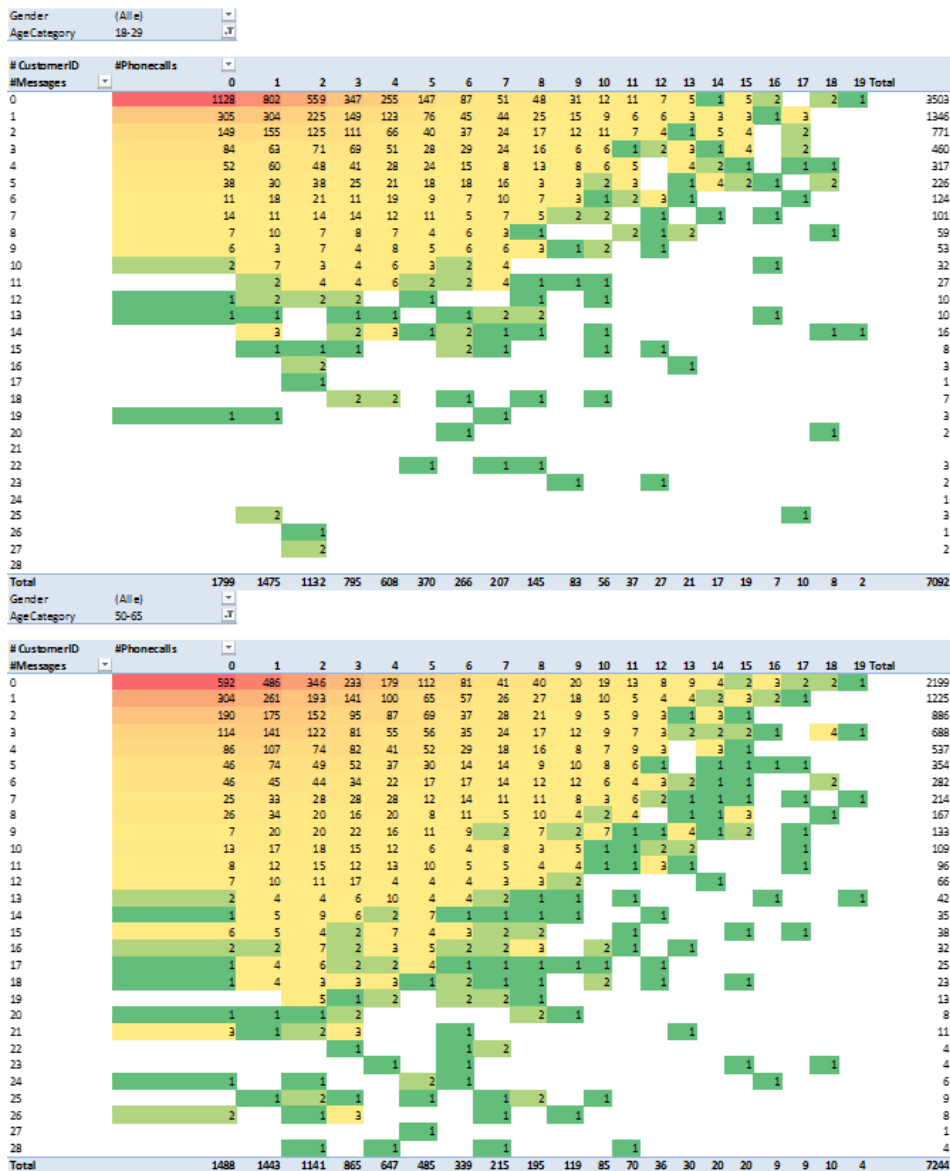


Figure 7 Comparison of age 18-29 (above) versus 50-65 (below) for the number of phone calls versus messages. Young people do not prefer messages to phone calls.

The overall count of phone calls, questions and messages supports the same conclusion (Figure 8). Men are even more inclined to use the phone than women.

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	#Questions	#Phonecalls	#messagesTotal	questions/messages	phonecalls/messages	questions/phonecall
M	60.329	38.181	30.025	2,01	1,27	1,58
18-29	13.427	8.535	4.257	3,15	2,00	1,57
30-39	14.825	9.255	6.682	2,22	1,39	1,60
40-49	13.622	8.583	7.375	1,85	1,16	1,59
50-65	18.455	11.808	11.711	1,58	1,01	1,56
V	58.553	36.449	36.018	1,63	1,01	1,61
18-29	15.240	9.558	6.628	2,30	1,44	1,59
30-39	14.295	8.821	8.675	1,65	1,02	1,62
40-49	13.659	8.442	9.364	1,46	0,90	1,62
50-65	15.359	9.628	11.351	1,35	0,85	1,60
Total	118.882	74.630	66.043	1,80	1,13	1,59

Figure 8 Young people prefer the phone, men (M) even more than women (V)

We have seen earlier that young people make less phone calls per customer. This is due to the fact that they receive WW for a shorter period of time, not because they prefer other means of communication.

5.5 Easier to phone, once you have used the call center a lot

A similar pattern can be seen when we look at the time it takes to make a number of phone calls. For every customer the number of phone calls was counted and the time between the first and last event of the trace was calculated and averaged for the agegroup. The result was then plotted in Figure 9.

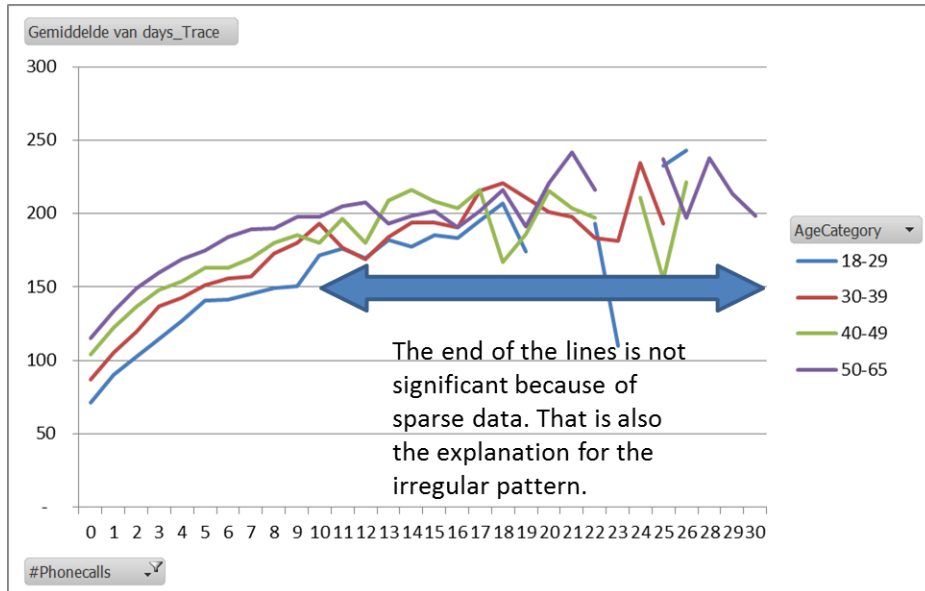


Figure 9 Average length of trace (days, vertical) by number of phone calls (horizontal). Young people reach the number of 9 phone calls after 150 days and the oldest customers after 200 days.

The lines in Figure 9 start steep and bends towards the horizontal: the time between phone call 6 and 7 is also shorter than the time between phone call 1 and 2. This indicates that people who get used to contacting the call center, will use it more frequently (question of UWV). It should however be noted that the majority of people do not make more than 5 phone calls. 5 is the average for those who have a very long trace. The beginning of the lines is fairly straight (see Figure 10).

5.6 No shift from messages to phone calls over time

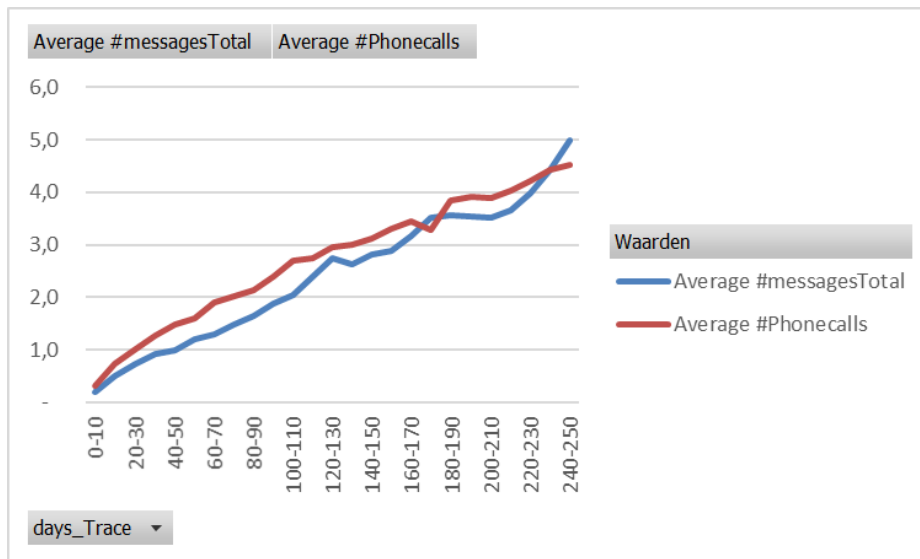


Figure 10 Average number of messages and number of phone calls for customers with different length of trace. The lines are almost linear, and there is no shift from messages to phone calls.

The great majority of customers use the call center, but there is no general shift from messages to phone calls over time. The best chances of reducing the cost of the call center would most likely be found in:

- (a) preventing questions by using proactive communication through e-mail and SMS;
- (b) targeting groups like young people /males with specific communication in order to seduce them to use messages;
- (c) experimenting with an app for the smartphone or a mobile website. There are groups of young people who only use mobile devices. From a smartphone it is easier to make a phone call than go through a website. If the logs of the call center contain the phone number of the inbound calls, then it is possible to see if frequent callers use their mobile phone. It should also be possible to see in de weblogs if a mobile device was used for the visit of werkmap and other pages.

6 Complaints Can Partially be Avoided

UWV wants to know what customer behavior leads to complaints. A relatively small number of people file an official complaint. The log gives a total of 289 complaints from 226 different people. From a cost perspective, the number complaints may not be a major issue. From a quality perspective it is clear that all possible improvements to the process should be pursued. Official complaints are often a tip of the iceberg. Many people are not happy but will not take the trouble of filing complaints.

Table 2. Number of Customers with one or more complaints.

#complaints/customer	#customers	#complaints
1	180	180
2	35	70
3	6	18
4	4	16
5	1	5
Total	226	289

6.1 Complaints Follow Use of the Werkmap

UWV likes to know what customer behavior leads to complaints. For this analysis it is assumed that the cause of complaints lies in the past and most likely in the very recent past. In the log the complaints have no timestamp (only a date). The complaints log was therefore merged with the ClicksLoggedIn and Phone calls and the complaints were given an artificial timestamp of 23:59 o'clock so that they happened after all other events on the same day. The last 10 activities before the complaints from every trace with a complaint were then analyzed in ProM. It is not possible to indicate a single webpage or behavior that leads directly to complaints. One reason is that, because of the missing timestamp, we do not know what the previous activity was. Events that often precede a complaint are various pages from the werkmap (tasks, messages, CV, vacancies for my CV, my applications) and questions about income statement form, payment and about complaints.

Many people do visit pages in the werkmap and questions on several subjects are also leading to complaints. Analysis with the web service Watson from IBM shows that people are more likely to complain when they:

- (a) have longer traces,
- (b) send many messages,
- (c) have many visits of werkmap/doorgeven taken.

6.2 UWV Can Improve Availability of the Website

It might be wise to also ask the question what UWV-behavior leads to complaints. If we look at the topics of the complaints, there is reason to assume that UWV-behavior is also a cause of the complaints.

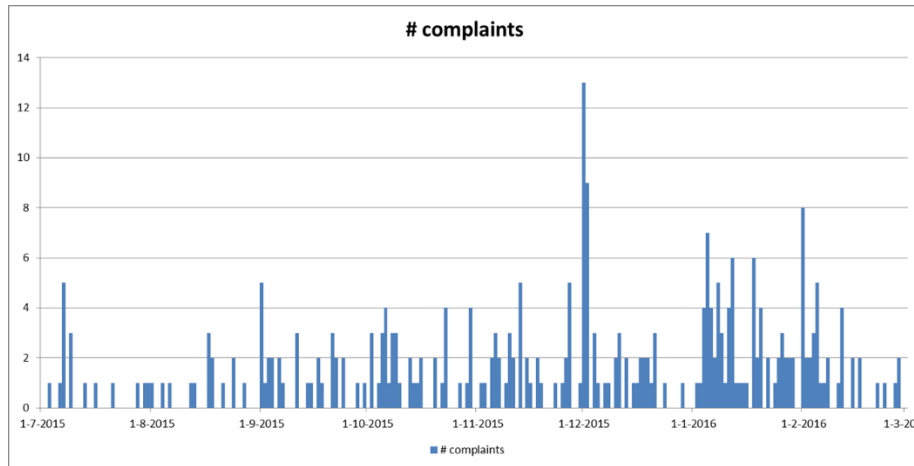


Figure 11 Many complaints after malfunctioning website in December, January and February

The availability of the website is an important cause of complaints. In December, January and February peaks in the number of complaints are caused by technical problems with the website. These problems must have hit thousands of customers and yet only 22 complained in December (**Table 3**), illustrating that official complaints are the tip of the iceberg.

Table 3. Complaints about availability of the website per month.

ContactDate	Number of complaints
jul	2
sep	2
okt	3
nov	2
dec	22
jan	10
feb	6
Total	47

6.3 Women File More Complaints than Men

When we try to explain the complaints by the characteristics of the cases, the first remarkable fact is that women in general file more complaints than men. There are two groups of customers in particular filing complaints: men age 50-65 and women age 30-39 (**Table 4**).

Table 4. Number of Customers with one or more complaints.

Age	M	V	total
18-29	13	33	46
30-39	29	56	85
40-49	27	33	60
50-65	59	39	98
total	128	161	289

The hot topics are the same for men and women. Women however complain more often about lack of respect, lack of information, treatment/coaching and accessibility of website and call center.

7 Clear Differences in Using the Website

In this chapter the differences between user groups (age, gender) are investigated. For this analysis a log file was created with:

- (a) all ClicksLoggedIn,
- (b) ClicksNotLoggedIn that could be linked to a customer through a unique IP-address,
- (c) Complaints of people that logged in,
- (d) Questions of people that logged in,
- (e) Messages of people that logged in.

This results in a file with 12,4 million events from 26k users. The size of the log causes problems with several software tools. Therefore, the CustomerID's from the ClicksLoggedIn file were split up by gender and age, and all activities of these users were retrieved using the SQL-query tool from Excel. Irrelevant technical URL's were filtered out. For every age-gender group a dummy case was added, with all relevant webpages in order to get identical trees for subgroups. These files were sorted by CustomerID and date/time and an extra column for previous activity was added. The occurrence of each transition from one activity to another was then counted, in order to further condense the files resulting in a directly follows matrix.

7.1 Analysis using the hierarchical structure

A tool was created in Excel to analyze the activities by plotting them on the hierarchical structure of the website. Many organizations have a hierarchical structure and it is useful to be able to see processes in the perspective of the structure. Similarly, the website of the UWV has a hierarchical tree structure. For a corporation the structure could consist of divisions, departments, units etc. For a website the hierarchy is found in the structure of menu's and reflected in the address of the pages.

All webpages were given their place in the structure by splitting the URL on every slash. That way a maximum of 8 levels were distinguished. For questions, complaints and messages additional top levels were created. These can then be split into different categories and topics. The activities were then represented as a block tree that can be pruned. With every activity a plus-symbol or minus-symbol can be clicked in order to show more or less sublevels. The big advantage of pruning over filtering is that the numbers still add up. The hierarchy allows us to cluster activities in a logical manner without getting meaningless clusters. In Figure 12 is shown how the activity `digid.werk.nl/home/diensten/aanvragen-bijstand/1.Yoursituation` is an activity at level 5 that shows 36.049 times in the log.

Activity1	Activity2	Activity3	Activity4	Activity5	Activity6	Activity7	Activity8	Total
Complaint				1-5-N.A.				2
				2-5-N.A.				39
				3-1-support				17
				3-2-availability				53
				3-3-payment				71
				3-4-information				105
digid.werk.nl	home	diensten	aanvragen-bijstand	1.Yoursituation				36.049
				2.Yourincome				8.821
				3.Yourpossessions				22.888
				4.Yourpersonalinformation				3.978
				5.Thelabormarket				3.340
				6.Otherinformation				6.626
				7.Senddata				4.596
				(leeg)				34.728
				aanvragen-tw				5.287
				1.Yourpersonaldetails				104.130
	2.Yourlastemployer				305.220			
	3.Thedismissal				125.244			
	4.Hoursworked				249.567			
	5.Otherwork				62.699			
	6.Youemploymenthistory				137.602			
	7.Supplement				125.580			
	8.Senddata				83.191			
	(leeg)				190.382			
	gegevens				15.006			
	overzicht				15.979			
(leeg)				1				

Figure 12 Block tree unpruned

If we are not interested in activities with low frequencies we can prune the complaints, and since the focus of the project is on WW-benefits we can also prune `aanvragen-bijstand` and `aanvragen-tw` that concern different benefits. This results in Figure 13.

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Activity1	Activity2	Activit	Activity4	Activity5	Activity6	Activit	Activity8	Total
			Complaint					287
			aanvragen-bijstand					121.026
			aanvragen-tw					5.287
			aanvragen-ww	1.Yourpersonaldetails				104.130
				2.Yourlastemployer				305.220
				3.Thedismissal				125.244
				4.Hoursworked				249.567
				5.Otherwork				62.699
				6.Youremploymenthistory				137.602
				7.Supplement				125.580
				8.Senddata				83.191
			(leeg)					190.382
			gegevens					15.006
			overzicht					15.979

Figure 13 Block tree with pruning for Complaint, aanvragen-bijstand and aanvragen-tw. 287 complaints are still visible and numbers do add up¹.

7.2 Small differences between customer groups

To analyze the differences between ages and genders, the results were split in 8 columns for different groups (Male 18-29, 20-29, 40-49, 50-65, Female 18-29, 20-29, 40-49, 50-65) and a column for the total population. In order to compare the differences, the frequencies were represented as a percentage of the total activities for every group. This gives us 9 columns that each add up to 100%. This generates a heat map as shown in Figure 14.

The bar-graph on the right side of the picture, represents the total population. The most frequent activities can easily be seen by the length of the bars. This general pattern does not differ very much between the 8 gender/age subgroups. To highlight the differences between the customer groups colors were added that mark the differences between cells on one row. The highest number is colored red, the lowest number is blue.

Even though the differences are small, we can distinguish consistent differences over several blocks of activities. It is difficult to read the all the text in this print, but on the screen it is possible to zoom in to examine the differences. The tool will give information on each cell after a mouse over (functionality not included in the PDF).

Figure 14 Next page: Tree structure of website, messages, questions, complaints, with heat map colors marking the differences within every row. Red= high, blue=low, white=average. The blue bars indicate the frequency of activities.

¹ 2 complaints in the file are from someone who did not log in, and are not included

7.3 Relative use of aanvragen-ww is high for young people

For males 18-29 the relative use of digid.werk.nl/home/diensten/aanvragen-ww (and its subactivities) is almost twice as high as for women 50-65 (15,87% versus 8,48%). Age is the principal driver of differences. This difference can be explained by the fact that older people experience more difficulties finding a new job and are entitled to receive WW for a longer period because they have a longer work history. Aanvragen-ww is a fixed effort for every customer, while other activities are variable and depending on the length of the WW-benefits.

This can also explain why the share of aanvragen-bijstand is higher for young people. They are more likely to lose their WW before finding a new job and less likely to have savings to provide for themselves. It might be interesting to find out why the differences for Thedismisal and Otherwork are so small.

m van Aan				Gender - AgeCategr								Total
Activit	Activit	Activit	Activit	18-29	30-39	40-49	50-65	18-29	30-39	40-49	50-65	Total
Complaint				0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
aanvragen-bijstand				1,34%	1,66%	1,00%	0,43%	1,53%	1,21%	0,72%	0,40%	0,93%
aanvragen-ww				0,06%	0,06%	0,04%	0,03%	0,06%	0,04%	0,03%	0,03%	0,04%
1.Yourpersonaldetails				1,21%	1,04%	0,79%	0,57%	1,10%	0,80%	0,75%	0,60%	0,80%
2.Yourlastemployer				3,92%	3,18%	2,22%	1,53%	3,51%	2,28%	2,07%	1,62%	2,36%
3.Thedismissal				1,16%	1,10%	0,93%	0,77%	1,05%	0,95%	0,98%	1,01%	0,97%
4.Hoursworked				2,80%	2,46%	1,85%	1,36%	2,62%	1,93%	1,78%	1,54%	1,93%
5.Otherwork				0,58%	0,53%	0,39%	0,39%	0,62%	0,47%	0,46%	0,52%	0,48%
6.Youremploymenthistory				1,61%	1,34%	0,93%	0,64%	1,61%	1,18%	1,01%	0,82%	1,06%
7.Supplement				1,53%	1,30%	0,93%	0,67%	1,34%	0,95%	0,86%	0,72%	0,97%
8.Senddata (leeg)				0,91%	0,83%	0,63%	0,48%	0,83%	0,64%	0,59%	0,51%	0,64%
gegevens				0,13%	0,09%	0,11%	0,15%	0,09%	0,08%	0,09%	0,14%	0,12%
overzicht				0,13%	0,14%	0,12%	0,10%	0,15%	0,14%	0,13%	0,12%	0,12%
(leeg)				0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
portalPP				0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
eintak inschrijven				6,84%	6,60%	5,05%	3,45%	6,74%	5,18%	4,65%	3,71%	4,97%
mijn sollicitaties				0,91%	1,16%	1,53%	1,64%	1,18%	1,38%	1,65%	2,04%	1,50%

Figure 15 Tree structure, zoomed in on WW application. Relative importance of the WW application is higher for young customers. Red= high, blue=low, white=average.

7.4 Relative use of mijn_werkmap is high for older women

The werkmap is accessed both through digid.werk.nl and www.werk.nl, but gets most hits through the digid-channel (login required). The relative use is higher for higher ages and women use the werkmap more frequently than men. Quite remarkable is that Men 50-65 use the werkmap only for “postvak” (mailbox) and looking for vacancies. Online training and working on the CV is more a women’s thing.

		portaal		U,00%	U,00%	U,00%	U,00%	U,00%	U,00%	U,00%	U,00%	
digid.werk.nl	werkmap	eintak	inschrijven	6,84%	6,60%	5,05%	3,45%	6,74%	5,18%	4,65%	3,71%	4,97%
			mijn_sollicitaties	0,91%	1,16%	1,53%	1,64%	1,18%	1,38%	1,65%	2,04%	1,50%
			taken	11,63%	13,05%	14,45%	12,49%	14,39%	14,70%	15,47%	15,44%	13,95%
			wijziging_doorgeven	0,55%	0,50%	0,46%	0,42%	0,56%	0,41%	0,44%	0,42%	0,46%
			(leeg)	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
			mijn_bewijs_van_inschrijving	0,16%	0,19%	0,23%	0,25%	0,17%	0,18%	0,22%	0,27%	0,22%
			mijn_rechten_en_plichten	0,09%	0,09%	0,10%	0,11%	0,10%	0,10%	0,12%	0,16%	0,11%
			mijn_agenda	0,09%	0,16%	0,14%	0,18%	0,10%	0,14%	0,13%	0,15%	0,14%
			mijn_netwerk	0,02%	0,04%	0,04%	0,06%	0,02%	0,03%	0,04%	0,05%	0,04%
			mijn_taken	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
			mijn_weg_naar_werk	0,01%	0,02%	0,01%	0,02%	0,01%	0,01%	0,02%	0,02%	0,02%
			mijn_berichten	2,70%	3,47%	3,83%	3,94%	3,77%	3,68%	4,16%	5,06%	3,88%
			mijn_documenten	0,67%	0,92%	1,02%	1,02%	0,94%	1,04%	1,20%	1,31%	1,04%
			mijn_tips	0,19%	0,30%	0,36%	0,45%	0,28%	0,34%	0,46%	0,64%	0,40%
			tijp-van-de-week	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
			mijn_cv	6,14%	6,33%	6,64%	5,62%	6,70%	6,54%	7,08%	6,75%	6,44%
			mijn_online_trainingen	0,08%	0,11%	0,13%	0,15%	0,12%	0,16%	0,19%	0,25%	0,16%
			vacatures_bij_mijn_cv	3,01%	5,10%	8,56%	11,00%	3,35%	4,60%	7,78%	8,05%	7,05%
			vacatures_zoeken	2,50%	3,02%	3,93%	3,89%	2,75%	4,44%	6,10%	6,73%	4,33%
			(leeg)	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
(leeg)	0,98%	1,35%	1,69%	1,68%	1,03%	1,22%	1,40%	1,56%	1,41%			
(leeg)	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%			

Figure 16 Women use the Werkmap more often than men, older customers more than young customers

7.5 People who apply for WW use website more intensively

Only a quarter of all registered users actually applies for WW (within the scope of the log). If we regard the activity 8.Senddata as the actual application, we can distinguish the behavior of people that do or do not apply for WW. To compensate for the period of unemployment, the number of clicksLoggedIn per day were calculated. People that do apply for WW use the website more intensively. Women use the website more than men and the intensity of use increases with the age of the customer.

Table 5. Average clicksLoggedIn/day: more intensive use by those who apply for WW.

Age	M		V		Total
	no application	WW-application	no application	WW-application	
18-29	2,0	3,1	2,1	3,4	2,3
30-39	2,1	2,9	2,3	3,4	2,5
40-49	2,3	3,0	2,6	3,5	2,6
50-65	2,7	3,6	2,8	3,7	3,0
Total	2,3	3,2	2,4	3,5	2,6

7.6 Customers mainly stay within www.werk.nl or digid.werk.nl

To visualize the flow through the website it is possible to create a follows matrix. In Figure 17 can be seen that most traffic is within www.werk.nl or digid.werk.nl. Messages come mainly after visiting digid.werk.nl and its subpages (48.506 times) and www.werk.nl (14.523 times). Questions are often preceded by a question and www.werk.nl precedes more questions than digid.werk.nl.

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Activity1	PreviousActivity1									
Complaint	Complaint	35	45		4		93	3		107
digid.werk.nl	digid.werk.nl	4	6.684.622	3.287	26.742	442	9.313	580	5.162	782.213
foutopgetreden.html	foutopgetreden.html		14.007	2.869	233	14	124	13	164	11.311
Message	Message	2	48.506	60	2.458	51	319	77	47	14.523
onderhoud.htm	onderhoud.htm	5	3.554	41	195	8.012	686	491	316	12.356
Question	Question	41	23.759	148	1.133	554	48.022	2.452	470	42.303
timeout.htm	timeout.htm	8	21.405	178	1.337	484	1.378	787	7.424	38.325
www.werk.nl	www.werk.nl	181	710.149	22.116	33.438	15.876	56.269	22.251	57.653	4.203.051

Figure 17 Follows matrix, pruned at level 1, shows that most traffic stays within digid.werk.nl or www.werk.nl. All transitions are counted from PreviousActivity1 (and subactivities) toActivity1 (and subactivities)

Questions from www.werk.nl come mainly (27.331 times) after a visit of www.werk.nl/werk_nl/werknemer/home. This is a general page that does not give any direction for changes that can avoid questions.

It is possible to draw the hierarchy in a traditional organization chart and plot the frequency of events and the transitions of the process in the drawing. The darker blocks and arrows represent high frequencies. The transitions enter the blocks from the left and exit from the right. Figure 18 zooms in on the werkmap process within digid.werk.nl.

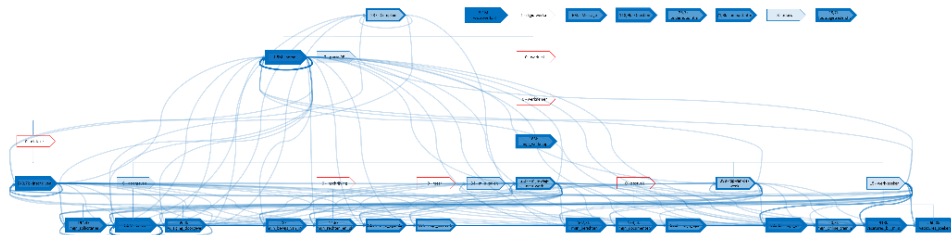


Figure 18 Tree map of the werkmap processes

When zoomed in on a screen, the chart can tell us that the activities at the bottom of the structure are more frequently used than their superior level. That is good because it means that customers do not need to go up and down to go from one page to the other.

7.7 Customer Journeys for Women and Men are Different

For comparing differences in the process flow of subgroups, it is more clear to present results as a follows matrix for different subgroups. If we do this for men and women and then subtract the values (men minus women) we see the different way that these groups flow through the process. For both genders the sum of all transitions was set at 100%. The difference in the relative use of transitions is presented in Figure 19.

Gender	M -/ - V											
AgeCategory	(Alle)											
Som van Aantal	PreviousActivity1	Complaint	digid.werk.nl	foutopgetreden.html	Message	onderhoud.htm	Question	start	timeout.htm	www.werk.nl	xdocs	Total
Complaint		-0,0003%	0,0000%	0,0000%	0,0000%	0,0000%	-0,0002%	0,0000%	0,0000%	-0,0001%	0,0000%	-0,0006%
digid.werk.nl		0,0000%	-2,9586%	-0,0003%	-0,0548%	-0,0006%	-0,0117%	0,0009%	0,0105%	-0,5053%	0,0000%	-3,5199%
foutopgetreden.html		0,0000%	-0,0132%	-0,0023%	-0,0003%	0,0001%	-0,0004%	0,0000%	-0,0002%	-0,0140%	0,0000%	-0,0303%
Message		0,0000%	-0,0830%	0,0000%	-0,0029%	-0,0002%	-0,0005%	-0,0001%	-0,0002%	-0,0235%	0,0000%	-0,1104%
onderhoud.htm		0,0000%	-0,0031%	-0,0002%	-0,0003%	-0,0038%	-0,0001%	-0,0012%	-0,0012%	-0,0165%	0,0000%	-0,0264%
Question		0,0000%	-0,0107%	-0,0002%	0,0005%	-0,0004%	0,0118%	-0,0015%	-0,0010%	-0,0031%	0,0000%	-0,0045%
timeout.htm		-0,0001%	-0,0313%	-0,0003%	-0,0037%	-0,0020%	-0,0033%	-0,0022%	-0,0158%	-0,0356%	0,0000%	-0,0943%
www.werk.nl		-0,0001%	-0,4179%	-0,0270%	-0,0493%	-0,0194%	-0,0041%	0,0057%	-0,0862%	4,3849%	0,0000%	3,7866%
xdocs		0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%
Total		-0,0005%	-3,5178%	-0,0303%	-0,1109%	-0,0263%	-0,0086%	0,0016%	-0,0941%	3,7868%	0,0000%	0,0000%

Figure 19 Differential follows matrix, pruned at level 1, representing all transitions for male minus female.

Men have relatively more transitions within www.werk.nl and women have more transitions within digid.werk.nl. Women also have more cross-overs from one domain to the other. Men have slightly more questions after a question or after a message. These differences increase when we add age to the comparison. Comparing males under 30 versus females over 50 results in Figure 20. The pattern is the same, but the differences are bigger.

Gender	M minus V											
AgeCategory	<30 minus 50+											
Som van Aantal	PreviousActivity1	Complaint	digid.werk.nl	foutopgetr	Message	onderhoud.	Question	start	timeout.htm	www.werk.	Total	
Complaint		-0,0003%	-0,0003%	0,0000%	0,0000%	0,0000%	0,0002%	0,0000%	0,0000%	-0,0004%	-0,0008%	
digid.werk.nl		0,0000%	-5,4221%	-0,0085%	-0,1153%	-0,0019%	0,0093%	0,0046%	-0,0115%	-2,1348%	-7,6802%	
foutopgetreden.html		0,0000%	-0,0539%	-0,0013%	-0,0004%	0,0001%	-0,0007%	-0,0002%	-0,0003%	-0,0434%	-0,1001%	
Message		0,0000%	-0,1301%	-0,0002%	-0,0101%	-0,0003%	-0,0006%	-0,0001%	-0,0005%	-0,0507%	-0,1926%	
onderhoud.htm		0,0000%	-0,0153%	0,0000%	-0,0005%	-0,0358%	-0,0009%	-0,0011%	-0,0014%	-0,0448%	-0,0999%	
Question		0,0003%	0,0751%	-0,0004%	0,0047%	-0,0013%	0,2179%	0,0083%	0,0003%	0,1058%	0,4108%	
timeout.htm		0,0000%	-0,0821%	-0,0009%	-0,0060%	-0,0040%	-0,0065%	-0,0019%	0,0047%	-0,1098%	-0,2065%	
www.werk.nl		-0,0007%	-2,0835%	-0,0887%	-0,0688%	-0,0566%	0,1618%	0,1292%	-0,1980%	10,0746%	7,8693%	
xdocs		0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	0,0000%	
Total		-0,0008%	-7,7123%	-0,1000%	-0,1963%	-0,0998%	0,3806%	0,1388%	-0,2067%	7,7964%	0,0000%	

Figure 20 Differential follows matrix representing all transitions for males under 30 minus females over 50.

7.8 Messages May Generate Questions

By pruning and zooming in on the follows matrix, we can see which activities in the werkmap lead to questions. Within digid.werk.nl the werkmap generates most questions (20.927). Tasks and messages are the two activities that most often lead to questions. It seems that the answers that people get in their mailbox or the inability to properly ask a question through the mailbox, causes people to pick up the phone 4238 times.

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PreviousActiv	Previous	PreviousAct	PreviousActivit	PreviousActivity5	PreviousActivity6	Questions
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	doorgeven	mijn_sollicitaties	787
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	doorgeven	taken	7422
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	doorgeven	wijziging_doorgeven	2017
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	doorgeven	(leeg)	
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	inschrijving		930
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	meer		117
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	mijn_taken		
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	mijn-weg-naar-werk		21
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	postvak	mijn_berichten	4238
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	postvak	mijn_documenten	848
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	postvak	mijn_tips	152
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	tip-van-de-week		2
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	werk-zoeken		3179
digid.werk.nl	werk_nl	werknemer	mijn_werkmap	(leeg)		1214

Figure 21 Werkmap activities that lead to questions. “Doorgeven taken” (tasks) and mijn_berichten (messages) are most frequently leading to a question.

8 Improvements Beyond the Process Flow are Possible

UWV asked for creative insights with regard to the customer journey. In this chapter some ideas are presented, that go beyond the process flow.

8.1 Underpromise and Overdeliver

According to the theory of marketing of services, an important factor to get happy customers is exceeding their expectations [5]. UWV does quite the opposite. The homepage states: “A new job you will find at werk.nl.” That is an outrageous promise when you have 75.000 vacancies available for 450.000 WW beneficiaries (plus hundreds of thousands who are unemployed but do not get WW). It would be better to underpromise and overdeliver and say: “These are hard times. On this website you can apply for WW benefits to ease your loss of income after losing your job. You will also find some tips and tools that may help you in finding a new job.” Lower expectations will lead to higher appreciation of the service.

8.2 Reduce the Stress Factor

Every Hollywood film producer knows how to raise the tension in a not so interesting story, by adding a few simple ingredients to the script:

- the hero gets an assignment;
- there is a strict time limit and the clock is ticking (digital clock on the screen);
- disaster will strike (a bomb will destroy the earth) if the hero doesn’t make it in time or when he makes a mistake.

UWV has added all these ingredients to its process:

- the customer has to supply in a lot of information on the website;
- there is a time limit of 15 minutes while you are logged in and the seconds are ticking away on your screen;
- if you make a mistake you will lose your benefits (and consequently your home, etc.)².

UWV should consider replacing the clock on the screen. On each screen there is only a small number of questions that need to be answered, so the 15 minutes should be enough for most people and we don't need to stress every second that has passed. A graph with an arc that gradually becomes smaller, with traffic light colors would be sufficient. Only in the last minute the seconds would need to appear on the screen. It might even be worthwhile to experiment with a message that only appears after 12 minutes, asking to save intermediate results without officially submitting them (see Figure 22).



Figure 22 Possibility to replace the counter by a graph to reduce stress.

An A versus B test with customers should determine if they prefer one time indicator to the other.

8.3 Add Chat Functionality to the Werkmap-Pages.

A customer could get instant answers if a chat functionality would be added to the website. That could be a reason not to pick up the phone. It should be possible to include the CustomerID and the webpage on the screen of the agent, in order to give relevant and tailor-made answers. A chat usually costs less time than a phone call. It also has the advantage that the chat can be stored and used as a reference by the customer. It can also be legal proof if a dispute arises between UWV and the customer.

8.4 Add a Q&A-section at the Bottom of Every Page

The author of this article has good experiences with a questions and answers section that was added to every page of a website. Customers can ask questions that will be answered by an agent of UWV. If a customer phones with a question that is relevant

² S. van Beek: "The threat of sanctions or the complete loss of my benefits was above my head, like Damocles' sword, if I would make a small administrative mistake." [3]

to others, the call center agent will add question and answer to the webpage. This Q&A can also be read by others, so that they do not need to phone the call center. In one organization a reduction of about 80% of the phone calls was achieved in this way.

8.5 Low 9to5 rate as an Indicator for Further Investigation

The use of the website is logged with a time stamp. The part of the web visits during office hours was calculated for every customer: the 9to5rate. That calculation shows that 2061 customers hardly (<10%) use the website during normal office hours. It would be interesting to see if this behavior matches their monthly income statement, or that it would be worthwhile to investigate if these people abuse the WW-benefits.

9 Conclusions and Recommendations

A number of preliminary conclusions can be drawn from the datasets of the customer journey. These findings need to be verified and discussed with UWV. These results can be the starting point of further research into the qualitative aspects of the processes involved.

9.1 Conclusions

The main results from the analysis of the logs of the WW-related processes of UWV are:

- The different customer groups have great similarities, but there are a number of differences in the way the website is being used:
 - the average young customer uses the website mainly for the application process, while older customers use more often the functionalities to find a new job. This may be caused by the fact that applying for WW is a fixed effort (once for every customer) and the work for finding a new job increases when people are longer receiving WW. Older customers are entitled to a much longer period of benefits and have more trouble finding a new job. This may mean that they are more inclined to use every means available to get a new job, especially since they usually have more financial obligations.
 - women are even more serious users of the assistance that is provided through the website. The difference with the older men, can not be explained from financial motivations or better opportunities on the labor market. Men behave more like hunters looking for vacancies, while women behave more like farmers trying to improve themselves with training and other support.

- older customers use a larger portion of the capacity of the call center than young customers, but this is also related to their longer traces. Remarkable is that young people often prefer the phone over messages.
- Messages are a serious alternative to phone calls for a group of customers. There are no very clear reasons in the log why people would not use messages. Users of messages seem to be more serious users of the werkmap, but it is not clear if that is a covariance with age.
- Questions are more likely to be explained and avoided by looking at the content of the questions, than from the process flow. The use of the werkmap and messages does however lead to many questions. A more in depth analysis could show if the customers experience particular problems with the content of the answers they get from messages and particular webpages.
- The use of the call center and messages increases over time, but mainly for those who have used these channel already more than average.
- Complaints are to be avoided, but not primarily from a cost perspective. Official complaints are rare and should be regarded as the tip of the iceberg. People who complain have often used the werkmap and messages a lot, so they seem seriously committed.
- Complaints should primarily be avoided by addressing the subjects of the complaints like unavailability of the website. The log does not give any red flags. Analyzing if complaints about missing information or impolite treatment are justified, should be a more promising direction than looking at the process flow.

9.2 Recommendations

From the analysis in this paper it is recommended to the management of UWV:

- to analyze the process with more data on significant events, like:
 - the moment that the customer actually loses work and the moment that he finds a new job;
 - the moment that the allowance stops because of the maximum period that an allowance is given;
 - these are significant moments in the process flow that can not be recognized from the current dataset;
 - a more elaborate dataset with more information on the selection of the data, might even allow for a fairly accurate prediction of the number of people that apply for WW.
- to investigate if people that phone more often (young people) own a computer or laptop or have to rely on a smartphone and prefer to use the call center for that reason.
- to consider developing an app or mobile website to accommodate this type of use;
- to actively send status updates and links to forms at the moment that a customer needs them, in order to avoid questions;

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- to consider testing a chat functionality and a Q&A section on the webpages where people look for information, in particular the werkmappages;
- to execute an A-B-test with different style of clocks on the screen, in order to reduce stress;
- to investigate the reasons why some customers never use the website during normal office hours.

10 References

1. TUE, <http://www.win.tue.nl/bpi/2016/challenge>
2. DOI 10.4121/uuid:360795c8-1dd6-4a5b-a443-185001076eab
3. Beek, S. van: Verdwaald in het digitale UWV-doolhof, De Volkskrant, 5 september 2015, retrieved from: <http://www.volkskrant.nl/tech/verdwaald-in-het-digitale-uwv-doolhof~a4135828/>
4. Simon, M: De strategische functie typologie, Kluwer bedrijfswetenschappen 1990
5. Vries, W. de, P.J.C. van Helsdingen, J.D.P Kasper: Dienstenmarketing Management, Stenfert Kroese, Breda, 2001
6. [http://statline.cbs.nl/Statweb/publication/?DM=SLNL&PA=37740wws&D1=0-5&D2=a&D3=0&D4=\(1-13\)-1&VW=T](http://statline.cbs.nl/Statweb/publication/?DM=SLNL&PA=37740wws&D1=0-5&D2=a&D3=0&D4=(1-13)-1&VW=T)
7. <http://statline.cbs.nl/Statweb/publication/?DM=SLNL&PA=37506wwm&D1=0&D2=a&D3=a&D4=l&HDR=T,G2&STB=G1,G3&VW=T>, preliminary figures, not corrected for seasonal fluctuations

Appendix 1: Variables in the Log

The log files have a similar structure with variables that identify user and activity.

variable	description
CustomerID	Unique number
AgeCategory	4 groups
Gender	M or V
Office_U	number
Office_W	number
SessionID	Number representing a group of page visits
IPID	Internet address of the customer
TIMESTAMP	Date and time
VHOST	Domain
URL_FILE	Webpage e.g. /werk_nl/werknemer/uitkering-aanvragen/uwv-dienstverlening/ww/50plus
PAGE_NAME	Name of the webpage
REF_URL_category	Previous website
page_load_error	0
page_action_detail	
tip	Tips for the customer
service_detail	
xps_info	Download documents
page_action_detail_EN	
service_detail_EN	
tip_EN	Tips for the customer

Appendix 2: Dimensions for Causal Analysis

These dimensions were used to see if messages, questions and complaints, and the application of WW could be predicted or explained. The data was analyzed with the Watson web service of IBM.

CustomerID
Office_U
Office_W
AgeCategory
Gender
#clicksLoggedIn
#clicksNotLoggedIn
#SessionsNotLoggedIn
#messagesCh1
#messagesCh2
#messagesTotal
#messageChannels
#Phonecalls
#minutesCalls
#Questions
#Complaints
ComplaintYesNo
startTrace
endTrace
days_Trace
open_closed
running/new
clicksLoggedIn/day
messages/day
applyWW_Y_N
#clicks 9to5-Y-N
9to5quote
vacancyCV
search vacancy
/werk_nl/werknemer/mijn_werkmap/doorgeven/taken
/werk_nl/werknemer/mijn_werkmap/werk-zoeken/mijn_cv
/werk_nl/werknemer/home
/werk_nl/werknemer/mijn_werkmap/postvak/mijn_berichten
/portal/page/portal/home/diensten/aanvragen-ww
/werk_nl/werknemer/mijn_werkmap
/werk_nl/werknemer/mijn_werkmap/doorgeven/mijn_sollicitaties
/werk_nl/werknemer/werkmap
/werk_nl/werknemer/eintake/inschrijven
/werk_nl/werknemer/mijn_werkmap/doorgeven/taken/vragenlijst-uwv
/werk_nl/werknemer/mijn_werkmap/doorgeven/wijziging_doorgeven
/werk_nl/werknemer/mijn_werkmap/inschrijving/mijn_bewijs_van_inschrijving
/werk_nl/werknemer/mijn_werkmap/meer/mijn_agenda
/werk_nl/werknemer/mijn_werkmap/postvak/mijn_documenten
/werk_nl/werknemer/mijn_werkmap/postvak/mijn_tips
/werk_nl/werknemer/mijn_werkmap/werk-zoeken/mijn_online_trainingen
/werk_nl/werknemer/vacatures
/zoeken_portlet/ajax/zoekAantalIndicatief
/zoeken_portlet/ajax/zoekBeroep
#Sessions LoggedIn
pages per session (loggedIn)

Appendix 3: Supporting Data

1 This appendix contains data that supports the text. It allows for verification, but does not provide new insights.

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Table 6 Number of messages by channel and customer group. Older people have a slightly stronger preference for channel 1

# messages	Channel		
Customer group	1	2	Total
M	66,23%	33,77%	100,00%
18-29	65,59%	34,41%	100,00%
30-39	66,19%	33,81%	100,00%
40-49	64,84%	35,16%	100,00%
50-65	67,37%	32,63%	100,00%
V	66,65%	33,35%	100,00%
18-29	64,13%	35,87%	100,00%
30-39	65,31%	34,69%	100,00%
40-49	66,63%	33,37%	100,00%
50-65	69,16%	30,84%	100,00%
Total	66,46%	33,54%	100,00%

Table 7 More sessions (logged in) for older customers and for women

Sessions per Customer	M	V	Total
18-29	13,08	16,67	14,93
30-39	19,12	22,48	20,77
40-49	25,23	28,65	26,94
50-65	34,87	37,92	36,24
Total	23,52	26,11	24,78

Table 8 More pages (logged in) for older customers and for women

Pages per customer	M	V	Total
18-29	136,91	173,88	155,96
30-39	202,80	243,89	223,07
40-49	279,44	324,75	302,20
50-65	381,63	409,87	394,33
Total	255,04	284,10	269,26

Table 9 With an equal number of pages per session (logged in)

Pages per session	M	V	Total							
18-29	10,47	10,43	10,45							
30-39	10,61	10,85	10,74							
40-49	11,08	11,22	50-65	10,94	10,81	10,88	Total	10,84	10,88	10,87
50-65	10,94	10,81	10,88							
Total	10,84	10,88	10,87							

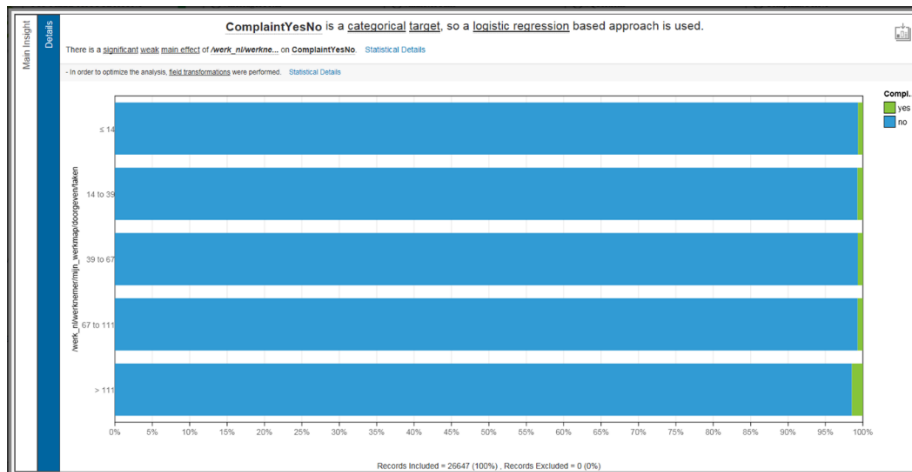


Figure 23 Cases with high use of werkmap/doorgeven taken do file more complaints. Analysis with Watson-IBM