

ICA 39<sup>th</sup> Conference  
Session Four

THE USE OF WEB ROBOTS IN THE SWEDISH TAX BOARD  
AND OTHER GOVERNMENT AGENCIES

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I am going to talk a little bit about our Web Robots, who are helping us in the National Tax Board, and helping us to deliver information to all our citizens. I am going to talk a little bit – what is a Web Robot? And how do they work? When can they be of use? I am going to tell you a little bit of a small business case that we had. First of all, what is an interactive assistant? Instead of saying interactive assistant one million times during this presentation I will call him Eric, because Eric is the name of our Web Robot.

Eric is a digital support person at our website, and the user always writing the question in plain English or plain Swedish or whatever, so you can see, here we have an example of a Web Robot called Tina and she says “Hello, I’m Tina, how can I help you?” Then the person is unlucky because she has a Nokia telephone. Sorry, Finland? But then, of course, we will deliver the best answer to this person. The deliver one answer to the person, why? Is there somebody here who thinks that we don’t have information in our society? We are drowning in information but if I want to also run a question, I want one answer. Because otherwise it is very hopeless. So our answer will be, of course I’m Swedish but answer surely will be by a Sony Ericsson. The response will normally consist of text answer relevant for web pages in some cases and in animation. Why do we have animation? It is because if you want people to get interested, if you want people to think this is funny, I want to make questions to this person, I think it is very helpful for us to have animation. This animation will blink his eyes and you see, okay he is looking at me. And he will nod and he will shake his head, and he will look furious, and he will happy, and so on, depending on what questions you put to him. Eric, first of all, he tries to match the question to the highest level of answers, knowledge levels, so they can present one single answer but this isn’t always what you say, not always, you can’t always do that so then he tries to the next level and the next level and the next level. I will explain it later. The higher level the more specific answer he can give you. One single answer as I said before is given to each question and if you don’t give Eric all the information that he wants to produce an answer we give him a following up question so we get more information from our client or customer.

We have a matching strategy that more important knowledge is held in the high level and the contact of the dialogue is included in the conditions and we have a multi-level matrix produced automatically with synonyms, with grammatical variations and it doesn’t matter if your spelling is wrong or you don’t use the grammatics.

The matching strategy then, as I said before, we have a pyramid that specific understanding that its use is given to straight answer. If it can’t give a straight answer in the first place you are asked the following up question and you can also give information from other databases if you want and if there is further information that you need to know that you don’t have in this Eric’s database you can transfer this to a

dialogue with an operator and then we have a level with general understanding giving general answer and relevant web pages or documents will be presented for you and then at least on the lowest level we have a keyword based understanding so the key word will give you some connection to some web place or documents.

This web robot Eric can be used both internal and external and the basis can be that internal you have to have more deep knowledge in a question and external it won't be so deep answers. So if you have a person in the phone you can use the web robot for your operators, the operator will write in a normal question and you get deep information on just that question.

There are a lot of other solutions that you can use our web robot for – you can use it as a navigation assistant, you can use it for support assistance, you can use it for e-Learning, you can use it as a human resource assistant, you can use it as a market assistant, you can use it as a form assistant. The only thing you can't do is when your imagination stops.

What's the difference between Eric and other search engines? It is of course that Eric's only give you one answer. If you put in a question in search robot or search machine you can get 10 or 20 size pages of information where you can read other information on this and this is the three-dimension web robot it means that you ask a question but the robot can't answer the question. Again the robot will ask you a question to get some more information from you. For instance I am working at the tax authority and it might be that one person is asking me or Eric, "I want to have a deduction" and of course we have a lot of deductions so there can't be a specific answer on that. So then the robot will ask, "What kind of deductions do you mean? Do you mean travel expenses? Do you mean capital gains?" And then he replies, "Okay, I mean travel expenses." And then the robot responds, "Do you mean travel by car, motor cycle or cycle and do you mean travel expenses from your work to your home?" And then the person will say, "Okay, it's travel by car and I want a deduction from travelling from my home to my work." So then they have a specific answer. If you should put this question into a search machine or search engine it would be very hard because then you have - you could present the book with 200 pages and then the customer would search for it himself but one thing you had to do is you had to put in all the information manually but in a search machine all this can be done automatically.

I want to say one word about this manual work. Don't you think in the beginning when we tested this robot we thought, oh, you have to make in 10,000 answers but we realised when we looked on the log file and the answers that we were given in this Eric's robot it was a few answers only to serve 70-80% of all the questions. So we have about 700 answers in the red robot and they serve about 70-80% of the questions.

Everything we do will have to be a gain for everybody. It had to be an advantage for your company, your agency and the clients or customers and first of all it reduces costs and then it speeds up the customer support works and of course ensures the consistency in the support given to your customers. This is a very important thing for us in the tax office because we have to be sure that the same question has the same answer whenever the question.

One of the great things with this is that being personalised you can receive a lot of information from your clients or customers because you can have follow-up questions to your customers just to see what kind of questions do a middle-aged man, married, two children, what questions does he have for the tax authority. You can make a lot of research and you get a gain back in this because I would be happy to show you dialogues on what questions people ask Eric. In some ways very personal questions to Eric, they ask him are you married, do you have kids and then we can use that information, use that to tell the customer back, oh, no I am not married because I am just a machine. We have those questions and then we can ask him back, are you married? And these log files we can log and investigation on the people using this web robot and investigation would question difference kinds of people are asking. That could be very useful when we later on have to have an information plan or whatever.

And for a client one thing is very good, with staff Eric wouldn't complain though he works 24 hours a day, 7 days a week. He won't complain of his salary, he works anyway, and it's easy for everybody to use this and it is an interactive communication and of course it can be a support for disabled people. You can use this as a multi-channel support. You can connect all channels into one and the same knowledge base. This is very good because it saves a lot of costs.

The ordinary support channel is personal visitor store, phone calls, IVR voice recognition, on-line chat with operators. We have on-line chat with Eric, e-Mail, fax and the web. Then the multi-channel supports of course such as inter-active assistance first, chat with the customer support staff, e-Mail as I said before.

Why do we want to have a multi-channel support. We wanted everybody, every citizen have the information that they want. We shouldn't force them to use one single channel or two single channels, they can use whatever channel they want because the main purpose is that they are happy with the information that we give them but of course we will push customers to the most cost efficient channel, the cheapest one but as I said before they had to resolve their problem and as I said before one of the best things with this is that we use one and the same knowledge base for every channel this is just a picture of how much it cost.

It is much cheaper to use the web and an interactive assistance but if we can't give an answer we have operator based chat and during the night you can notify the operator for following up e-Mail or call, then a phone call, e-Mail and personal visit to the store.

One of the goals that we have, as little citizens as possible in the offices because it costs a lot of money and then we have a possibility to hand over Eric to the officer.

First of all, Eric will answer the question but if he can't answer the question it will be handed over to a transfer dialogue to an enquiry so the officer will see the dialogue that the customer had when he asked Eric so then the officer can have a telephone call and then she can see at a terminal what the next question is so she can be prepared for the question and then she can connect and talk to the customer or client and then as I said before also we can make an analysis for us.

Why do we want in some cases to hand over the problems? One says Eric can't help the customer, one says in some cases we want a real person to take care of complaints and special questions and so on and in some cases the person will want to talk to a real person. I am taking this a little bit short because I am short of time. We have this confusion with e-Mail, you can connect in robot Eric to an e-Mail system. We could have analysed the e-Mail, put up the questions and then Eric can prepare an answer. In some cases this answer could be send back directly. In some cases this answer could go by first to an assistant who looks on the answer and sees if that is correct and then complete the answer and then give a reply mail.

We can have this solution to telephone also and reducing the speech recogniser in combination in IVR.

A little business case. In the tax offices in Sweden we have a target group for about seven million citizens who need to deliver an income tax declaration to us. We have a period about six weeks when they should leave their income tax declaration. In the middle of March, we send out a pre-filled income tax form and on the 2<sup>nd</sup> May, they have to send it back. And during this time, we have about 3 million visitors at the Swedish tax administrator website, and in the busiest time we have about 36,000 calls per hour through our telephone. So we need a solution to deal with all these questions, and we need a fast solution. And also, as we say, we have a rather large website, about 35,000 pages. We have a cooperation; I talked about the answers and dialogues and so on, before, we have a cooperation between Eric and 22 banks. We have cooperation with Itellia, the operator with Swedish post, about concerning the electronic ID. And we have displayed Eric on about this figure is wrong: it is about 160-170 municipality websites. The result - there always has to be a game as I said in the beginning - Eric: we haven't advertised him very much, just last year we had a lot of advertising for him, but we have answered more than 500,000 questions during this period – since we started in 2003. If we think about the cost for one telephone call, we have calculated on that the cost will be about 10 Euros per connection, and then we saved all the investing money in 6 weeks in 2003.

We have also a new project, this is called Kim, another web robot, and he is cooperating with nine other Swedish agencies. The main thing with this, this web robot, Kim or if it is Eric or whatever the names are, we can connect in one knowledge base – you don't have to have several knowledge base.

This is a picture of Eric, and he states "Hello, I'm Eric and I am here to help you". This is from the main page from the taxing authority. Then we are explaining in a lot of material what Eric is. This is an example of one of the banks who is exploring Eric on the webpage, and he says: "Hello, do you want to leave your declaration form?" So they are linked to the tax authority. We need to cooperate with other organisations and so on. This is a municipality and it just says "Click here if you want to know a little bit of electronic ID". This is Kim. I am just going to say a few words about Kim. This is a robot who is connecting nine authorities – information in one question. So she says "Hello, I'm Kim and I'm here to help you and answer questions to all the authorities according to driving licence, starting your own business, taxes, support for studies, jobs and so on. And we have other references in the industry. We have a little firm here in Sweden called IKEA, I don't know if you know about it.... But it is a worldwide business, and they are having this solution now so that all over the world you can ask the robot Ikea any questions about the store and deliveries and prices, and

so on. If you want you can go into England or United States, or Germany or whatever land you prefer, ask questions to the robot in IKEA because they have the same solution but it is in your own language. Ikea would put the language in all over the world in a few years, the same solution. Because they are seeing it, they have just one knowledge base for all over the world. They have just one translation - it will be where she comes from.

This is just an example of different kinds of public sectors using their robots. With this solution, the customers who are in services, sales and Internets. So I can see in the future that we have some kind of solution. In Europe we have something called V.A.T. The same rules in every country in Europe according to V.A.T. So it would be possible to have one knowledge base in Europe for all questions on VAT.

In one minute, can I have one sentence? I have some wonder: I have listened to all of your speeches and they are very interesting, and one thing that has popped up in my mind when I was talking to Stockholm a couple of minutes ago, then I thought do we take responsibility for the backside of this development? I thought about it because when I see today in our society I go to my daughter's kindergarten. I go there (she is 5 years old) and I see children playing with the Gameboys - just 3 years old, they are sitting on a bench, they are not running around playing. I go to my son's school, and they are sitting still, they have game-pads also. They are not running, they are not playing. I read in a magazine that a 5-year-old boy eats medicines because of depression. I see that we have more elderly people, more elderly population and of course, it could be e-Government, u-Government, e-Government but the question of them all is it might be h-Government in the future. Why? I think, and I hope I am wrong, but we can look up on the very high costs in medicines in the future so it will be health-Government. We save a lot of money in these technical issues but what will be the cost in future if all the young people do not have to move, do not have to run, just sitting by the computer if we can reach them everywhere? That is just a question. Thank you.

***Cheng Poy***

We will take just one question for Kay first, before we move on. Yes, Denmark?

***Claus Neilsen, Denmark***

Who has told Eric here he is not married? It must be based on a big deal of Meta Data and semantics, the robot I mean. How do you organise the knowledge base?

***Kay Kjoer***

We organise it in the way that we have an expert on different kinds of subjects. We have experts on capital, we have experts on income tax, we have experts on different areas. And they take care of the answers, then they look up into the logs for information in the database and then they put in the new answer.

***Hyeon Kon JunKim, Korea***

Just one simple question. Have you had any serious problems or bad experiences while maintaining this Eric?

***KayKjoer***

I think one of the problems is legislation. We have pilot project with this e-Mail, we don't have it in use with the public because we don't have the legislation for that. I think that is the main problem, the legislation and what we want to do, and often on the same level.