

# The Role of Virtual Servants in e-Interaction

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**Abstract:** Internet-based interfaces between organisations and their buyers are becoming increasingly common. Lately virtual servants have been identified as agents to support the customer – supplier interaction. In this paper we investigate the existence of one such virtual servant – Anna at IKEA.com – in a business interaction situation. Anna is regarded as an example of a typical virtual servant of today. Based on pragmatic theories for business interaction we investigate the role of this virtual servant. The conclusion from this study shows that this virtual servant does support the potential / particular buyer in navigating on the company’s web-site rather than the realisation of a purchase.

## 1 Introduction

When browsing on companies’ web sites you nowadays not only find information about the companies, their products and how to buy (often via the web site) but sometimes also encounter a person-like “being” that encourage you to start a dialogue. Often it comes in the shape of a woman and more specific as one that works in the customer service department. The headset and friendly smile is something you normally associate with front office personnel in a hotel lobby, check-in desk at the airport or imagine they look like when having a telephone conversation with a customer service representative. These so called virtual servants could then be understood in accordance to their specific contexts. They are created on the basis of pre-defined patterns of actions that customers are expected to perform when interacting with the web sites and/or customer service. Virtual servants can be seen as artificial agents that acts on behalf of the supplier and should thus support the interaction process in the line of desired communicative acts. Are they then to be seen as a complement to the web sites and/or to the manual customer service or as some kind of improvement? Are they a way to establish a human-like interaction? Their role in relation to customers’ other possible ways of interactions is therefore of interest. The virtual servants seem to play a role in guiding the potential customer in his/her task to perform actions on the Internet. However, what do they actually do and what type of dialogue is

possible? Since they are located on companies' web sites one could expect to have a business-like dialogue with them.

Business interaction is constituted by actions directed between the different parties involved in the interaction process. These actions constitute exchanges in the business interaction and are of different types, such as offer, proposals, commitments, fulfilment and assessment. Such actions emphasise the pragmatic dimensions and goes beyond just seeing interaction and communication as information exchange. Communication means to act. A pragmatic approach means that one has a focused interest on what actually is done (= actions).

As Schoop, de Moore and Dietz [SMD06, p. 1] mention in their pragmatic web manifesto there is a need to understand how different actors communicate and develop a shared understanding. "Ontologies are not fixed, but co-evolve with their communities of use. Communication partners have to agree continuously on what they can assume to be the shared background. [...] In order to enable the use of the Web for communicating, agreeing upon, and cooperatively modifying ontologies, the support provided by the Semantic Web is insufficient." Studies about how virtual servants respond are therefore relevant in order to create a more dialogue-like interaction. Organisations that provide these kinds of agents can learn from the interactions and develop a better socio-technical infrastructure.

In order to exemplify the dialogue capacity and role of virtual servants the pragmatic theory Business interAction and Transaction Theory (BAT) [e.g. GL04ab] is used to formulate questions that a customer would be expected to ask when interacting with a company's personnel. The BAT-theory has proven to be a suitable theory for analysis and evaluation in many different business settings (c.f. e.g. AGM00; GM01; Li02; HL05). The research in this paper that can be characterised as a qualitative study has thus been performed by using BAT-theory to analyse an invented scenario describing the wants and needs of a typical client. The theory has been used as a source of inspiration for posing questions, in the context of the scenario, directed to the virtual servant. The answers provided by the virtual servant have been used as a basis to perform the analysis. Schoop, de Moore and Dietz [SMD06] argue that insights from the language-action perspective, among others, can serve as a theoretical foundation for communication modelling and system design. We have chosen to describe whole conversations in order to provide an illustration of the interaction to the reader. The purpose of this paper is therefore to investigate what kind business dialogue that is possible and exemplify the role that a virtual servant has in a business Internet setting (B2C). The results could be used by companies as a starting-point to improve their virtual servants' interaction capacity with customers.

This paper is structured as follows. First we investigate the notion of virtual servants. Then, a number of different frameworks for business interaction are put forward, and the BAT-model is chosen and more thoroughly described. Following that we generate a number of questions, derived from BAT, to be used for studying the role that a virtual servant could play. After this more theoretical part we de-

scribe the scenario and state the questions to Anna, the virtual servant of IKEA, as a basis for the following analysis. The paper is concluded by a number of highlights found in the investigation.

## 2 Virtual servants defined

Virtual servants [e.g. Gu05] become more and more common on the Internet, especially on business related sites. A virtual servant, virtual agent or animated interface agent [e.g. Ma94] can be described as computerized agents that “[...] appear on the screen as embodied characters and exhibit various types of life-like behaviours, such as speech, emotions, gestures and eye, head and body movements” [DM00, p. 1-2]. Yet another related phenomenon is *avatars*. As Gerhard, More and Hobbs [GMH04] describe the word avatar comes from the Sanskrit language and can be translated as *incarnation* or *God’s appearance on earth*. An avatar can thus be seen as the embodiment of a user in a virtual world [e.g. Ta02]. In this study the avatar can be seen as a virtual representative of the company; most probably a customer service representative. Avatars do however not always take on human forms. An example of this is a project (Avanti) described by Albinsson and Forsgren [AB05] where the aim was to create eGovernment services for people with no experience of using computers. A photorealistic humanoid avatar was first used but later on changed to a cartoon dog since elderly people told elaborate stories of their problems which was not understood by the humanoid avatar. The cartoon dog made the elderly talk in a more simplistic manner like when talking to a child. The shape thus seems to make a difference regarding interaction.

The introduction of this kind of technology in a business environment is often related to cost-cutting agendas and strives to improve the communication with customers. The customer’s interaction with a computerized interface provided by the company can also be described as a specific kind of service encounter [BBM00]. Gustavsson and Czarniawska [GC04] mean that the replacement of humans by virtual, interactive agents seems to be a logical continuation of the trend towards system-oriented services such as ATMs, Internet bank services or voice navigated telephone services. According to Gustavsson [Gu05] who has studied virtual agents from a gender perspective, these agents can be an on-line extension of the marketing and sales function and lead customers through the sales process. They can also perform customer services and to some degree replace/complement companies’ customer self-help systems such as call centres (ibid).

As Gustavsson [Gu05, p. 405] mentions: “virtual assistants are supposed to relate to people’s everyday understanding of what they represent – be it gender, profession or specific competencies”. Virtual assistants should also be seen as representations of corporate image and therefore their appearance and movements should constantly be monitored and improved to fit the image (ibid).

## 3 Understanding Business Interaction

### 3.1 Frameworks for business interaction

In this paper the role of the virtual servant is studied in a business interaction setting. Within the language/action (L/A) community there is an interest for business interaction. Several frameworks have over the years been developed and proved to be fruitful. The strength of the language/action perspective is that it is based on the idea that communication is not just transfer of information. When you communicate you also act [Se69]. In business interaction, actions are performed in order to establish and fulfil mutual expectations between business parties. The management of agreements is to be regarded as the backbone of L/A-approaches. Both agreements on what to do and agreements on performed actions are accentuated.

Sometimes agents, other than human beings, act on behalf of the organisations. In this paper the way a virtual servant act on behalf of the organisation is studied. Since virtual servants might establish expectations it is vital that virtual servants also perform desired actions. Otherwise the relationship between the organisation and its customers might be harmed.

The different frameworks, that have their foundations in the L/A-community, are Action Workflow (AW) [MWF92], DEMO [Di99] and Business interAction and Transaction Theory (BAT) [GL04ab]. Common characteristics between these different frameworks are that there is an emphasis on interaction between two different roles coming to and fulfilling agreements, the interaction is structured in several phases, and that communicative acts are regarded as the co-ordinating mechanism. As Goldkuhl mentions: "The general idea is to get a business model of how people, through conversation, coordinate their work. Such a business model, focusing on coordination, should be seen as foundational for the development of supporting software. The LAP spirit is to consider software as a tool for coordination" [Go06, p. 53].

Language/action based frameworks for business interaction are promising since these focuses on communication and the creation of commitments between different business parties. In business interaction communication cannot be restricted to mere information transfer. There are also other initiatives for frameworks of business interaction. Originally outside the language/action tradition, Schmid & Lindemann [SL98] have presented a reference model for electronic markets. This reference model has in later works [LS00] been expanded to a more general framework - a media reference model. Building on an explicit L/A-orientation Schoop [Sc02] has presented a framework for complex negotiations. This framework is based on the idea that business interaction consists of three phases; the search phase, the negotiation phase and the fulfilment phase.

Based on the criticism put forward by Goldkuhl & Lind [GL04ab] and Goldkuhl [Go96; Go98] we have chosen to use the BAT-model as a basis for stating questions to a virtual servant. The main reason is that the BAT-model acknowledges communicative as well as material acts in the interaction process, that the exchange character of business interaction is emphasised, and that a symmetric view on business parties and their interaction is adopted [GL04b]. In this way we can determine the role that a virtual servant has today, but also address issues of how a virtual servant could serve a need in the future. It is claimed that the BAT-model is a solution for a number of deficiencies in the other frameworks (AW and DEMO). The BAT-model has been applied in many different studies and in this way been further refined [c.f. e.g. AGM00; GM01; Li02; HL05].

### **3.2 The BAT-model**

The BAT-model was introduced in the mid-nineties [c.f. Go96; Go98] originally as a six-phase model describing generic business interaction logic. The model described interaction between a supplier and a customer. Based on experiences derived from several case-studies when the model has been put into application, the model has been refined as a framework consisting of three different models. The framework [GL04ab] distinguishes between a market level (interaction between potential customers and potential suppliers) and two types of dyadic interaction; *frame contracting* and *separate (single) transaction order*.

On a market level a supplier interacts in relation to potential customers and vice versa (search phase). In the BAT-model there is an emphasis on adopting both a supplier and customer perspective (a symmetric view). The role of a customer arises from a lack of capability. There is something in the customer's activities, which need to be resolved, and this may be done through purchase of a product. The customer searches for knowledge about potential products and potential suppliers to meet the demands. Through these knowledge search activities, the customer's understanding of the product requirements may emerge. The customer may more directly expose the desire to get into contact with potential suppliers. This market interaction is driven by general business interests of both suppliers and customers. When a contact is reached between a supplier and a customer this interaction may proceed to the dyadic interaction.

Moving into the dyadic level two different levels of business interaction can be identified; frame contracting and business transaction. The frame contract is an agreement that governs the subsequent recurrent business transactions. On the dyadic level interaction occurs between a particular supplier and a particular customer, where the interaction is structured as consisting of several (communicative and material) exchanges; exchanges of proposals, commitments, fulfilments and assessments. Agreements are established through exchanges of proposals and commitments. Exchange of proposals means negotiation between the two parties. Exchange of commitments means the establishment of each party's obligations

within the scope of the dyadic interaction. These obligations concern the expected future business actions of each party. The exchange of fulfilments means the exchange of value. It is only on this level that the exchange of value (goods and/or services in the exchange for money) occurs. If either part is not satisfied with the fulfilment, a reclaim might be directed to the other party, which occurs during the assessment phase. Of course, appreciative assessments may also be exchanged. There may be a recurrence of dyadic interaction between the particular supplier and customer over time. This means also a continual development of business relations. Before the dyadic interaction begins there exists some type of business relation between the two parties. If the parties have traded earlier experience-based business relations exist and these form pre-contractual relations giving expectations for the next turn of business interaction. This also means that post-contractual relations become pre-contractual when the parties enter a new dyadic interaction. As Keen et al [KBC00] state, trusting relations are of key importance in e-interactions.

From this short presentation of the BAT-model a number of questions to state directed to a virtual servant could be derived. Examples of such ones are:

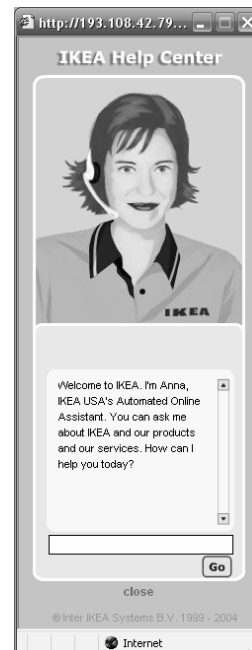
- I am looking for product X. Do you sell that?
- What is the price of product X?
- I need the following characteristics of product X? Can your company fulfil my needs?
- If I buy Z amount of product X what would my price be?
- I would like to order Z items of product X.
- When can Z items of product X be delivered?
- Two out of Z items of product X were broken. What do I do now?
- Etc.

#### 4 A virtual servant in business-to-consumer context

Our example of a virtual servant is Anna who resides on the Swedish home furnishing company IKEA's Internetsite<sup>1</sup>. As described in The Wall Street Journal [Mo05]: "Anna is the new face of customer service at Ikea.com. She's an online automaton, relying on linguistic theory and a complex database to give consumers answers to their queries. Corporations are increasingly relying on such technology, in large part because the automations, who often come with an animated face and first name, are far cheaper than their human counterparts." We consider Anna to be a good example of a typical virtual servant in today's business world (see also referral to The Wall Street Journal). She is a photo-unreal representation of a young female and wears a characteristic t-shirt with the logo (identical to those worn by "live" IKEA personnel) that indicates that she a member of the company. The head-set further narrows it down to the customer service department. The text above her head reads "IKEA Help Center" and below her she invites to interaction: "Welcome to IKEA. I'm Anna, IKEA USA's Automated Online Assistant. You can ask me about IKEA and our products and our services. How can I help you today?"

She blinks with both eyes, raises her eyebrows, makes a big smile and tilts her head to the left at the first interaction with her. These are all signs of non-verbal communication with a purpose to make the visitor feel welcomed. Non-verbal signals are of central importance in human social behaviour [e.g. Ar90].

Since Anna does not speak these signals can be of some importance. A customer who wants to interact with her therefore needs to write the question. Does this disqualify any other interaction besides questions? As we will show it does not, but "Just ask Anna!" indicates that the company wants to control the interaction in some way. There is however no further indication of what type of interaction is possible. Could a customer who wants to buy a product get help from Anna – all the way from search phase to the final fulfilment? Could the customer even return to Anna after the purchase with additional questions or complaints? We illustrate what interaction is possible by describing a scenario involving a bookcase.



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<sup>1</sup>[http://www.ikea.com/ms/en\\_US/](http://www.ikea.com/ms/en_US/)

#### 4.1 Scenario: Linda and Andrew decide to buy a bookcase

Linda and Andrew live in a small town near Baltimore. Both are in their thirties and are extreme book consumers. One day preparing breakfast they discuss their urging need of storage for all their books. They are looking for additional bookcases that has the right style, colour and size that matches their needs. Linda and Andrew start searching the Internet and find IKEA's web site. They are also curious about buying on the Internet since they have not done that before. Since both of them are busy working and do not have time to travel around to find a suitable storage for their books they also see Internet shopping as suitable. When entering IKEA's site they encountered a customer service like virtual person that invites them to have an on-line discussion – "Anna, from the IKEA Help Center, is here to offer you quick and direct answers for your Ikea related questions. Before calling your local store, try asking Anna!" As novel Internet users regarding shopping they see this as a help to buy a bookcase. Below follows the conversation that took place when Andrew and Linda interacted with Anna (Q = question posed, A = answer given by Anna). Besides Q & A there is also a short description of what happened on IKEA's web site (Internet:) and what conclusion Linda and Andrew made after each interaction with Anna (Conclusion:). They both find the interaction interesting so they decide to try different questions.

- Q: I would like a bookcase. Do you sell that?
- A: Please have a look at the Bookcases.
- Internet: A new web-page is opened. This page exposes different types of bookcases.
- Conclusion: We were directed to a relevant page for our needs. By stating the question to her she fulfilled our needs.
  
- Q: I would like a brown bookcase
- A: Please have a look at the Bookcases.
- Internet: The same web-page is opened. This page still exposes different types of bookcases.
- Conclusion: We did not get any more precise answer. The shown page does not show all the different brown colours of bookcases.
  
- Q: I would like to store 300 books.
- A: I'd love to be able to discuss literature with you but my job is just to talk about IKEA.
- Internet: No change.
- Conclusion: We did not get any help concerning the utilisation of the bookcase.



- Q: Do you have bookcase that is 250 cm in width and 250 cm in height?
- A: Please have a look at the Bookcases.
- Internet: No change.
- Conclusion: We did not get any help concerning the utilisation of the bookcase.

Andrew and Linda now think that Anna cannot really fulfil their knowledge needs about bookcases. They do however hope that IKEA could fulfil their product needs. They decide to manually scan the Ikea web pages for a suitable bookcase and finally find one product type that seems to fit their needs (both financially and use) – a Billy bookcase. Since they have learned how to find a specific bookcase they decide to buy three and also try to get a discount. They approach Anna again and first ask the price of one bookcase.

- Q: What is the price of a Billy bookcase?
- A: You can see the price of BILLY bookcase and other product information on the web page I'm opening for you now.
- Internet: A new web-page is opened. This page exposes the price (\$119.98) of one type of Billy combination.
- Conclusion: We were directed to a relevant page for our needs. By stating the question to her she fulfilled our needs.
- Q: Can we get a discount?
- A: Because IKEA prices are already so low, additional discounts are not offered.
- Internet: No change.
- Conclusion: We were informed that IKEA don't give any discounts.

Anna informs them about the price and that IKEA doesn't give additional discounts. A bit disappointed they decide anyway to buy three bookcases. They order via IKEA's web site and one week later they receive the bookcases. Excited they start unpacking. After a while their initial excitement fades when they discover that one bookcase has a damage probably caused by the transport. They turn to Anna for advice how to handle their complaint.

- Q: I bought a bookcase and it was damaged from the transport.
- A: We want you to be satisfied with your new IKEA products. If you are not satisfied with something you have purchased, please bring it back to the store for return or exchange. Here is the IKEA Return policy.
- Internet: A new web-page is opened. This page shows information about IKEA's return policy.

- Conclusion: We were directed to a relevant web page.

Like in some previous interactions Anna directs them to a relevant web page. However they don't want to travel to an IKEA store. The company should send them a replacement part and they will discuss it with the customer service center when they call. Linda and Andrew decide to check all three bookcases in some detail before they make their complaint. They begin to assemble the two undamaged bookcases and are almost finished when they notice that there are screws missing. They ask Anna again.

- Q: There are some screws missing in one bookcase I bought.
- A: If you are missing anything from your purchase, all you need to do is return to your local IKEA store. Just go to the "Returns and Exchanges" desk with your original purchase receipt and a friendly co-worker will be happy to assist you.
- Internet: A new web-page is opened. This page shows the location of different IKEA stores in USA. The page encourages the web user to select a store by clicking on the town's name.
- Conclusion: We were informed how to proceed and got directed to a web page that shows Baltimore.

They decide to call the customer service department at IKEA to get more information. The person they talk to apologise for their inconvenience and promise a new delivery with the damaged part and some additional screws within a week. They don't have to travel to IKEA after all and return the damaged part. One week later Linda and Andrew celebrate their solved book problem with a bottle of wine. Although they didn't get the dialogue-like interaction they expected from Anna they are anyway a bit grateful that Anna directed them to the relevant web pages.

## 5 Analysis

From the empirical investigation in the previous section it can be concluded that Anna plays a role in navigating Linda and Andrew to the correct web-sites giving them relevant information about their needs. From a BAT-perspective this means that the virtual servant aids them in the search phase. The role of this virtual servant should however not be seen just as a complement to the existing web-site.

The virtual servant Anna seems to fulfil a role as a starting point for inquires that customers have. Anna is not all that specific in her answers, instead rather blunt, but she gives guidance of where to begin. In the search phase this virtual servant can be used to quickly find a specific product but it is not useful when there is a need for detailed specification of a product, i.e. colour, size and so on. It is also not possible to negotiate about price but that is more related to company policy than the capacity of the virtual servant. However more detailed answers in the search

phase would make the customers effort to find the right product easier. This is also true in the fulfilment phase. The virtual servant could be used by the customer to actually buy the product. For example if a customer informs the servant that he/she is looking for a specific type of Billy bookcase the servant could respond with a “Do you want to buy the bookcase?” If the customer answers yes he/she could be directed to the last phase on the web page where an acceptance of the order is made. As for now the servant does not have an active role in the fulfilment phase. In the assessment phase the virtual servant performs her role as a guide to the frustrated couple. Anna is not a performer – she rather directs where to perform actions. Anna directs them to a web page with information about how to proceed with their complaint. On the web page there is also information about telephone numbers to IKEA’s customer service.

In the table below an analysis is put forward where we illustrate a potential customer’s exchange with Anna in relation to the BAT-model.

<b>Type of exchange</b>	<b>Support by Anna</b>
Knowledge and contact (market level)	Support is given by guiding the customer to the correct web-site to a certain extent.
Proposals (dyadic level)	The issue is thought of, but there is no personalised offer to the customer.
Commitments (dyadic level)	No support is given
Values (dyadic level)	No support is given
Assessments (dyadic level)	Support is given by guiding the customer to the correct web-site to a certain extent.

It seems that the virtual servant is no good at giving precise answers to particular customer needs. The study indicates that the virtual servant does not distinguish between interaction on market level and dyadic level. This might have to do with the fact that the virtual servant does not manage turn-taking conversations, i.e. the answers do not differ dependent on earlier action pairs.

Another issue is that the virtual servant does not seem to acknowledge the customer’s utilisation of the potential product - both in terms of functionality and in terms of design. A virtual servant with that capability would recognize the individual needs of different customers. The main function of this specific virtual servant thus seems to be to help customers to navigate correctly on the web-site.

## **6 Conclusions**

In this paper a theory for investigating the role of a virtual servant in a business interaction has been investigated. This has been done by using a pragmatic framework for business interaction, the BAT-theory, in which the communicative function in different utterances are emphasised. This theory’s strength is that it can be

used, and has been tested [c.f. e.g. AGM00; GM01; Li02; HL05] in many different types of business frameworks and interaction situations. Based on that and this study we consider BAT to be a robust model that works well as a pragmatic lens to test different scenarios of interaction. The paper's qualitative approach give a more in depth insight about of how a virtual servant reacts when confronted with BAT-generated questions.

The analysis of the virtual servant in the studied business setting shows that:

- 1) the communicative function of some particular utterances issued by the potential/particular buyer is interpreted correctly and some desired effects are achieved
- 2) the more specific the questions become the less support does the virtual servant give
- 3) the answers given is rather navigational aspects in relation to the existing web-site than giving concrete answers to the stated question
- 4) the virtual servant does not support several related action pairs (turn-takes) – it is rather a one-to-one (question – answer) support
- 5) the communicative function of the answers given by the virtual servant is clear.

Different kinds of media such as the virtual servant, web-sites and a contact with a real person at the customer service are used to perform the whole process from search to fulfilment. Considering the lack of dialogue and limitations regarding its abilities is it really necessary to have a virtual servant? Companies' web-sites are today getting increasingly overloaded with information and are sometimes difficult to navigate. That constant change of web sites can also create difficulties. The advantage of a virtual servant is that it could help customers to find a product relative fast - if the customer knows what he/she wants. This service can be provided 24 hours a day 7 days a week. The servant can catch the customer's attention and offer assistance before he/she choose to call the company's customer service. This can if frequently used lead to lower costs regarding customer service.

This kind of technological solution is probably also a way for an organisation to show that it is innovative. A virtual servant with turn-taking capacity could however handle a business dialogue in a more efficient way. The technical side of servants therefore needs to be developed further. These service tools for customers are still in their infancy. The study shows that virtual servants can be tested by using a pragmatic framework such as BAT to engage in a dialogue and thereby generate knowledge of what needs to be developed further.

Based on this study we believe that there might be different types of virtual servants. Such ones that assist in navigating on the company's web-site versus such ones that actively could help realising the purchase. One area for further research would therefore be to develop criteria for different kinds of virtual servants. Another issue is virtual servants on the customer side of the interaction – an electronic

assistant – searching for ever-increasing offers on the Internet to fulfil the needs of a particular customer. What would that mean for the interaction between customers and organisations?

A challenge for contemporary organisations is the increasing need for an understanding of customer behaviour and what customers want regarding products and services. We believe that questions put forward to virtual servants could play an important source of inspiration for a continuous improvement of a company's interaction repertoire.

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