

# **Intelligent Agents in the Human-Computer Interaction**

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# Agenda

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- ⇒ **Introduction**
- ⇒ **Foundations of intelligent software agents**
- ⇒ **HCI and intelligent agents' features**
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# Introduction

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- Basic idea: simplify use of programs and render computing more efficient
- Later conception: „make an agent think”
- ELIZA – „ancestor” of all agents, 1966 r.

ELIZA is available on many websites, for example:

<http://www-ai.ijs.si/eliza/eliza.html>

# Foundations of intelligent software agents

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- Intelligent agents help users fulfil specified goals. In order to act autonomously, without human intervention, agents have to communicate with users to learn of their preferences and needs.
- Development of science and technology led to inclusion of artificial intelligence architectures in agent constructions. This resulted also into calling them „intelligent”.

# Intelligent agents today

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Intelligent agents appear more and more often in an everyday life, because they are no longer “narrow-minded” creatures that appear in desktop environment:

- they are able to process data flow and manage data information
- they intermediate in electronic commerce
- they contribute to get customer loyalty

# HCI and intelligent agents' features

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Intelligent agent is a computer system situated in some environment that is capable of flexible autonomous action in this environment in order to meet its design objectives.

HCI attempts to ensure successful interaction between humans and machines by determining the most efficient way of presenting information to the user on a screen.

Agent technology, based on autonomous intelligent agents, is technology that promises to improve human factors in information systems. This technology seems to be very promising in overcoming several user-interface problems.

# Intelligent agents in e-commerce applications

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Internet is an environment where act many agent-based intelligent applications:

1. Shopping agents
2. Selling agents
3. Marketing agents
4. Virtual assistants

# Use of virtual assistants

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The range of virtual assistants' application is very wide:

- e-commerce
- consulting
- public relations
- e-marketing
- education and entertainment



# Virtual assistants in use



# Jochen Keller - recruits potential workers of German SAP



The image shows a recruitment banner for SAP. At the top left is the SAP logo, and to its right is the slogan "THE BEST-RUN BUSINESSES RUN SAP". Below the logo is a black and white photograph of Jochen Keller, a man in a suit, smiling. To the right of the photo is a blue text box with white text. At the bottom of the banner is a light blue input field and a right-pointing arrow button.

**SAP** THE BEST-RUN BUSINESSES RUN SAP

Guten Morgen und herzlich willkommen bei SAP!

Mein Name ist Jochen Keller, ich bin Personalleiter für eine Reihe von Business Units bei der SAP. Deshalb bin ich sicher der richtige Ansprechpartner für Sie.

Am besten kann ich Sie verstehen, wenn Sie Ihre Fragen in einem kurzen und vollständigen Satz formulieren.

# Sara – assists clients on a Spanish insurance website



**Sara** informs on different types of health insurances and other available services.

# Wolfgang Schuhmacher – an assistant in a German Ministry of Education



**Wolfgang** teaches graduates how to create a businessplan and found their own enterprise. He explains the rules of market analysis and the firm management.

# Erik Expert – consultant in a Zurich Group maklerweb



Willkommen im Maklerweb der Zürich Gruppe

Home Produkte Tarifierung Vertrag und Schaden Vertriebsservice Materialien Stando

▼ Hilfe

- Online-Anmeldung
- Mail an Erik Expert
- Systemvoraussetzung
- Umgang mit PDF-Dateien
- Ansicht animierter Seiten
- Hinweise zur Sicherheit

Hilfe

**Gestatten, mein Name ist Erik Expert, ich bin der virtuelle Helfer im Maklerweb!**



Sind Sie bereits für das Maklerweb angemeldet, und möchten Sie mehr über unseren Auftritt erfahren? Dann steht unserer interaktiven Unterhaltung nichts im Weg!

[Fragen an Erik Expert](#)

Sollten Sie noch nicht für das Maklerweb registriert sein, gelangen Sie hier zur Anmeldung.

[Online Anmeldung](#)

# Polish virtual assistants

In spite of the popularity of hundreds of virtual representatives on foreign Web sites, Polish virtual assistants' world is represented by **only six** personalities, three of them being demonstrative ones.

**Adam** (Ster-Projekt, 2003 r.)

**Tytus** (EGB Investments, 2004 r.)

**Hubert** (Ergo Hestia, 2005 r.)



# Virtual assistants of Fido Interactive



Podpis elektroniczny jest to narzędzie pozwalające na jednoznaczną identyfikację osoby przesyłającej wiadomość przy wykorzystaniu środków elektronicznych. Wiadomością tą może być zarówno zwykła korespondencja, jak i zlecenie bankowe, umowa, a także inne materiały, np. multimedialne obrazy lub muzyka. A jeżeli tego jeszcze nie wiesz, chętnie wyjaśnię Ci jak działa podpis elektroniczny. Mam mówić?



<http://www.sterprojekt.com>

A demonstrative assistant **Fido** advertises services of his employer - a firm that implements virtual assistants.

**Adam** – specialist in an electronic signature field.



Cześć! Czy pozwolisz, że na wstępie zapytam Cię, skąd o mnie wiesz?



<http://www.fido.pl>

# Virtual assistants of Sztuczna Inteligencja



Witam. Mam na imię Joanna. Moim zadaniem jest przeprowadzenie z Tobą ankiety na temat botów. Nie będę analizować Twoich wypowiedzi, ale zrobisz mi wielką przyjemność odpowiadając na moje pytania. Zgoda?

Assistant Joanna  
–conducts  
surveys on other  
virtual assistants.



Witam. Jestem Tytus. Mam nadzieję, że będzie nam się dobrze rozmawiało. Jak masz na imię?

Tytus informs users  
about debts and  
vindications. He is  
employed by EGB  
Investments, leader  
on a domestic  
receivable market.



# The newest Fido Interactive virtual assistant (January 2005)



Witaj! Nazywam się Hubert i jestem doradcą klientów Grupy Ergo Hestia w zakresie likwidacji szkód. Chętnie udzielię Ci informacji na temat zgłoszenia szkody oraz procesu jej likwidacji i odpowiem na pytania z nim związane. W czym mogę Ci pomóc?

**Hubert** - a specialist on damage liquidation procedures in Ergo Hestia Group.

As an insurance specialist, he informs his interlocutors on damage liquidation procedures and explains professional notions concerning insurance market. He knows actual share price of his employer and basic exchange indexes.

# Advantages and drawbacks of intelligent agent applications in the HCI context

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Many potential customers quit the websites because:

1. search engine is inefficient and doesn't provide the information needed,
2. FAQ lists and help documents are uncomplete or misleading,
3. there is no on-line real time support, neither automatic nor human-like,
4. process of filling in an on-line formular or doing an on-line registration are often complicated, lengthy and tiring.

Virtual assistants seem to be a “technological cure” for those difficulties.

# Advantages of intelligent agent applications in the HCI context

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Virtual assistants serve as polyvalent Internet tool:

- they gather and compute information and communicate with potential customers in a form of dialog
- they provide a user 24 hour assistance on a website
- they autonomously accomplish many e-commerce related tasks, cause an increase in website visits, prevent of unnecessary phone calls and reduce cost of providing online customer service.
- they observe and imitate the user, receive instructions from him and sometimes ask other agents for advice

# Advantages of intelligent agent applications in the HCI context

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- individualization
- ability to accomplish many tasks
- a tool that increases rates of return visits by attraction of new users to a website
- capability of creation a customer loyalty as well as better perception of a company image
- unrestrained availability
- ability of collection the information about users through an observation of site visitors
- a possibility of connection with other enterprise systems

# Intelligent agents can help with two main problems concerning HCI

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1. On the basis of previous observation of user habits and preferences, they enable a customization of computer interfaces and adaptation to individual needs.
2. They enable the computer interfaces to accomodate the increase in complexity of technology.

# Measurable profit and the future of virtual assistants

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Enterprises that employ virtual assistants point out that they brought about to:

- 15% increase in return visits rates
- 20% - 30% increase in a number of on-line transactions
- cost reduction through prevention of unnecessary phone calls and e-mails (one virtual assistant answers 500 up to 1000 questions daily, and therefore replaces about 30 help-center consultants)
- 15% - 40% cut of the cost of providing online customer service

# The nearest future

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Many possibilities of intelligent agents' application have not been discovered yet. Virtual assistants are implemented both on commercial websites and non-commercial, public administration sites. Specialists are working on virtual assistants' application in self phone technology, in a direction of WAP and SMS development.

Development of intelligent agents is a challenge not only for engineers and programists but also for economists and managers for a reason of the increasing role of intelligent agents in Internet, business and management.

**Thank you  
for  
Your Attention!**

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