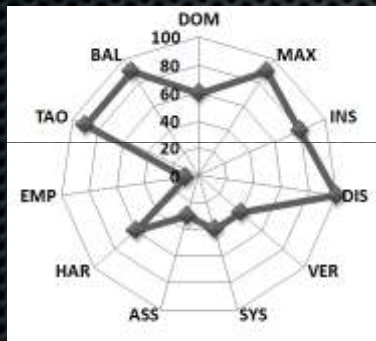


# AGH

## University of Science and Technology

### Department of Automatics

# An Intelligent Internet Shop-Assistant Recognizing a Customer Personality for Improving Man-Machine Interactions



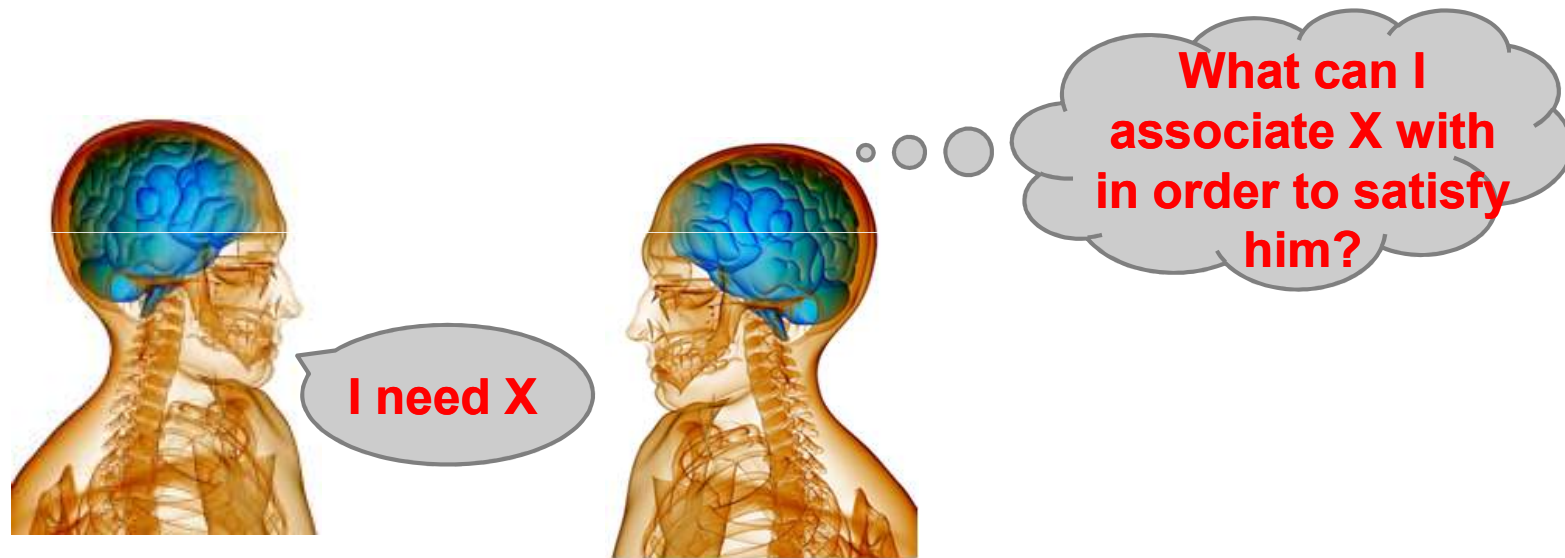
Chatbot: what do you mean by long standby? For example you can specify capacity of your desired battery.  
Customer: I don't know  
Chatbot: Do you wish your mobile phone to have vibration alert ?  
Customer: No please  
Chatbot: Understand, maybe you want your mobile phone to have USB?  
Customer: Actually yes, I want that  
Chatbot: Thank you for all your requirement

Adrian Horzyk

Stanisław Magierski

Grzegorz Miklaszewski

# Intelligent reaction to human needs



- Intelligence can recognize and associate human needs.
- Intelligence is usually perceived when somebody appropriately reacts for other human needs.

# Artificial Intelligent Reactions



I need X



What can I  
associate X with  
in order to satisfy  
him?

- There is no real valuable artificial intelligence without human **needs recognition** and reaction to them.
- Artificial intelligence should properly **associate needs** with things people are talking about.

# Human Personality Needs

This paper and presentation:

- describes various personality needs and types and defines beneficial reactions to them,
- shows how a chatbot can linguistically automatically recognize human personality types,
- presents how a talk or a product presentation can be tuned with the recognized personality in order to produce positive human reaction during a talk to a chatbot,
- compares satisfaction in case of using of this model.

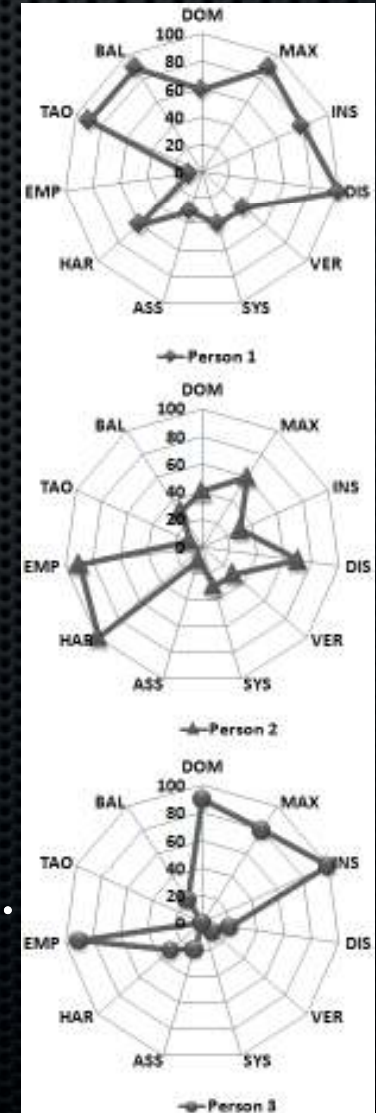
# Human Personality Types (HPT)

This paper applies the special typology of human personality:

- **Dominant (DOM)** – decides, chooses, manages...
- **Maximalist (MAX)** – likes extremes, raises standards...
- **Inspiring (INS)** – spontaneous, looks for inspiration...
- **Discovering (DIS)** – discovers, asks frequently...
- **Verifying (VER)** – compares, distinguishes, verifies...
- **Systematic (SYS)** – organizes, sorts, arranges...
- **Assurant (ASS)** – protects, assures, prevents...
- **Harmonious (HAR)** – makes peace, avoids quarrels...
- **Emphatic (EMP)** – compassionates, empathizes with...
- **Task-Oriented (TAO)** – is subjective, practical, sensible...
- **Balancing (BAL)** – counterbalances, calibrates, levels...

The more exact description is in the conference proceedings.

Intelligence can temper, reinforce or supplement one's personality.



The application of  
the presented typology  
to  
a chatbot – customer talk  
and  
a product offer presentation

# Project goals

- Full sales conversation (about mobile phones)
  - Gathering requirements in an open conversation
  - Specify customer requirements
  - Offer a presentation
- Implementation of HPT
  - Discovering customer's HPTs
  - Adjusting an offer presentation
  - Improve e-commerce efficiency

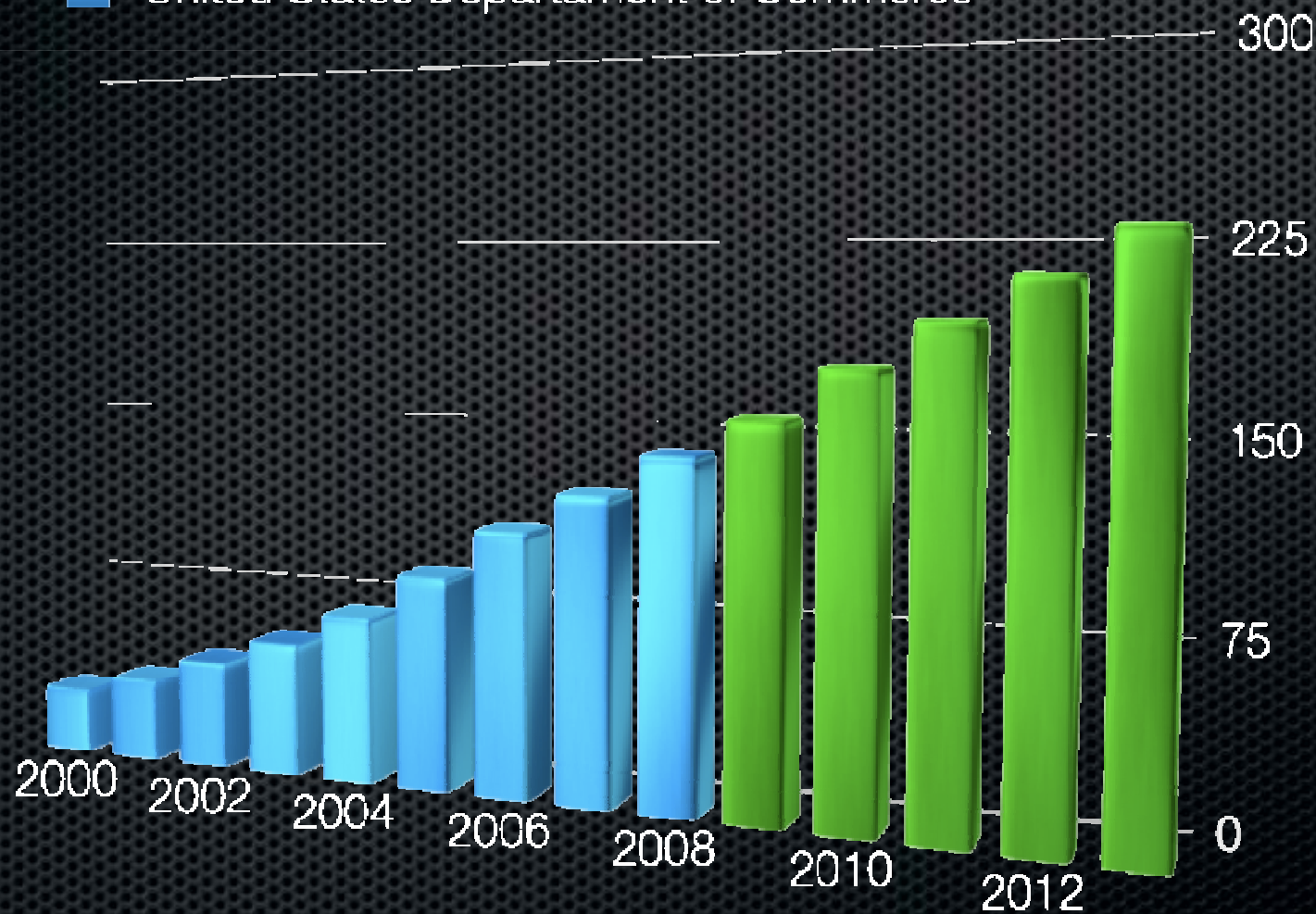
# E-commerce objectives

- Evolution of marketing concepts
- Interactivity of WWW
- Importance of interface and user experience
- Individual optimization



# E-commerce Growth

- Forrester Institute
- United States Department of Commerce



# Chatbots & Virtual Avatars

- Simulating intelligent conversation in a natural language
- Implementation
  - ELIZA
  - A.L.I.C.E.
  - Fido:intelligence
  - E-commerce  
(e.g. IKEA, Lyond)



# E-shop implementation

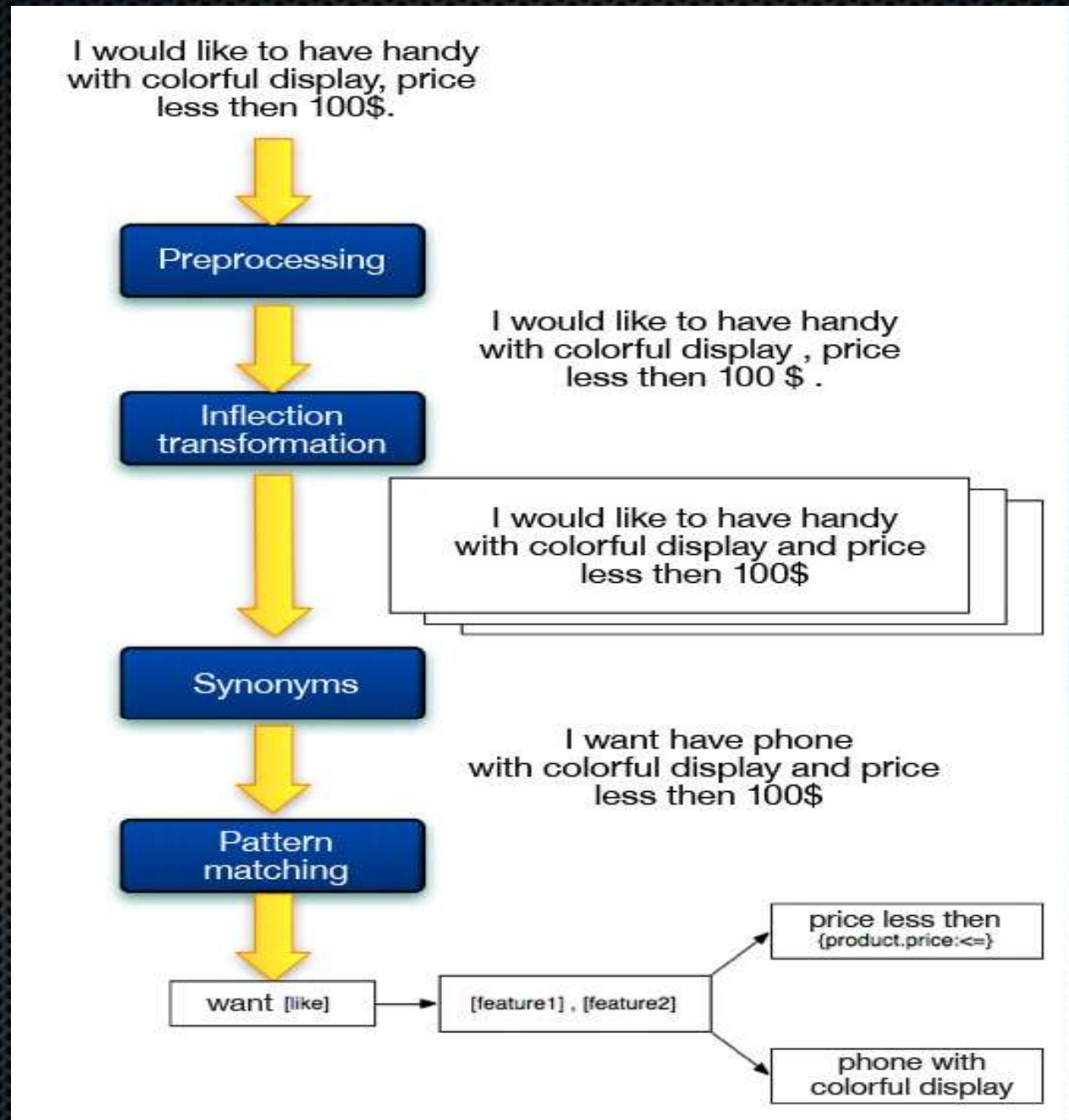
- Substruct e-shop platform (Open Source)
- Mobile phones:
  - wide choice
  - standardized parameters
  - common good

The screenshot displays the 'sklep.s.i.' website interface. At the top, the logo 'sklep.s.i.' is accompanied by the tagline 'sztuczna inteligencja na zakupach' and a search bar. Below the header, there are navigation links for 'Wishlist', 'Contact Us', 'Track an Order', and 'zakupuj się'. A search bar with a 'Search' button is present. To the right, there are icons for a shopping cart, mobile phones, and a key, along with the text 'Ilość produktów: 4 łączna kwota: 450,00 zł' and a link to 'zobacz swój koszyk'. The main navigation bar includes 'Home', 'Chatbot', 'All Products', and 'On Sale'. The 'Virtual Assistant' section features a chatbot interface with a female avatar and a text input field. The chat history shows a conversation about a price reduction and battery specifications. The 'Offer Presentation' section displays a grid of mobile phone offers, including Sony Ericsson, LG, and Samsung models with their respective prices.

Product Name	Price
Sony Ericsson 2558	2507.00
LG KF750 Secret	2380.00
LG KE850 Prada	2321.00
Samsung ZV30	2298.00
Philips Xenium 9@9e	2298.00
Sony Ericsson W980	2372.00
Sony Ericsson C902	2323.00
Sony Ericsson C702	2374.00

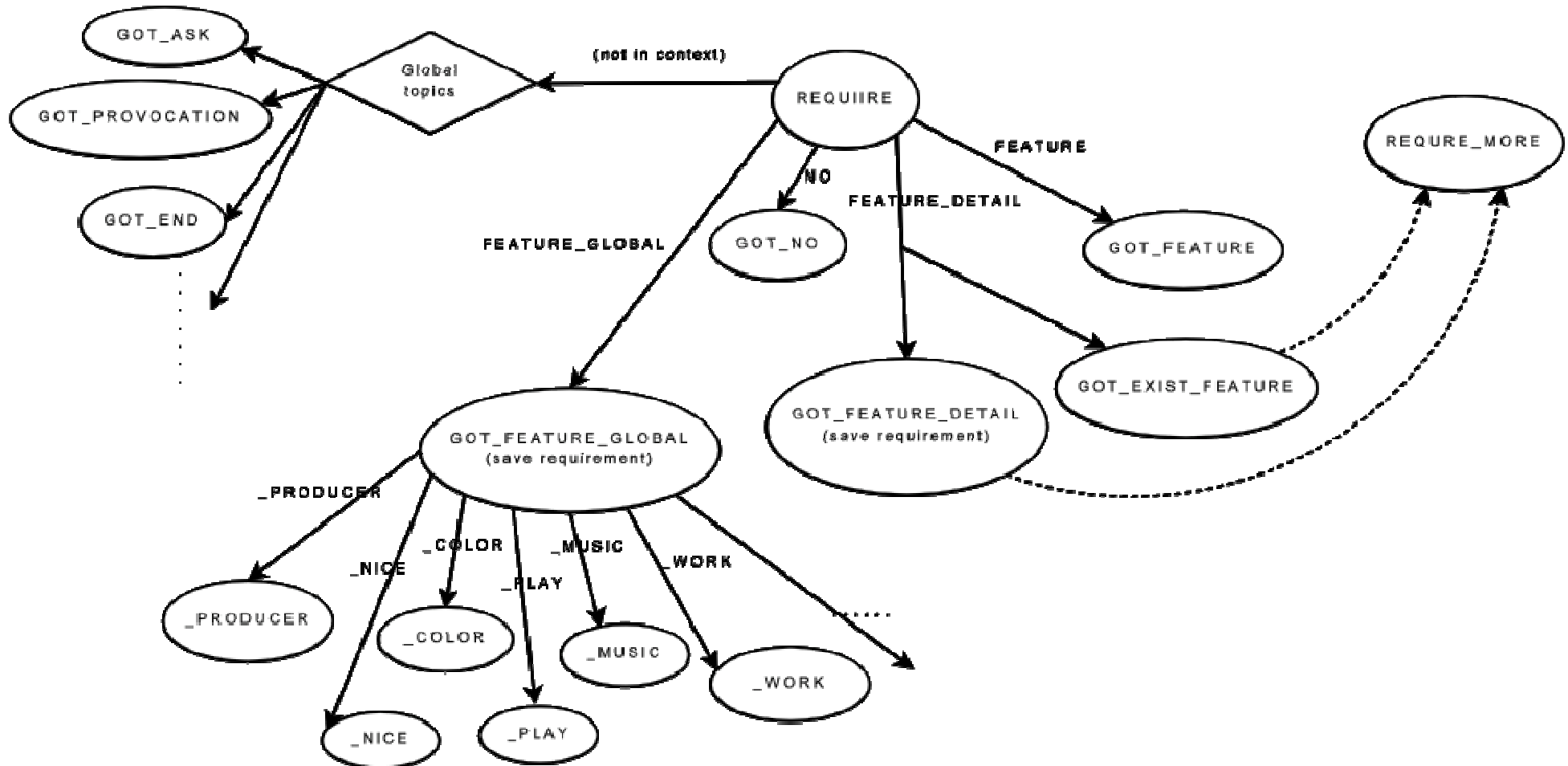
# Conversation engine

- preprocessing
- inflection transformation
- pattern matching
- customer's requirement discovering



# Conversation structure

- conversation opening
- free talk
- inquires stage
- presentation



# Understanding a customer

- gender

- personality

- Dominant (DOM)
- Maximalist (MAX)
- Inspiring (INS)
- Discovering (DIS)
- Verifying (VER)
- Systematic (SYS)
- Assurant (ASS)
- Harmonious (HAR)
- Emphatic (EMP)
- Task-Oriented (TAO)
- Balancing (BAL)

- needs

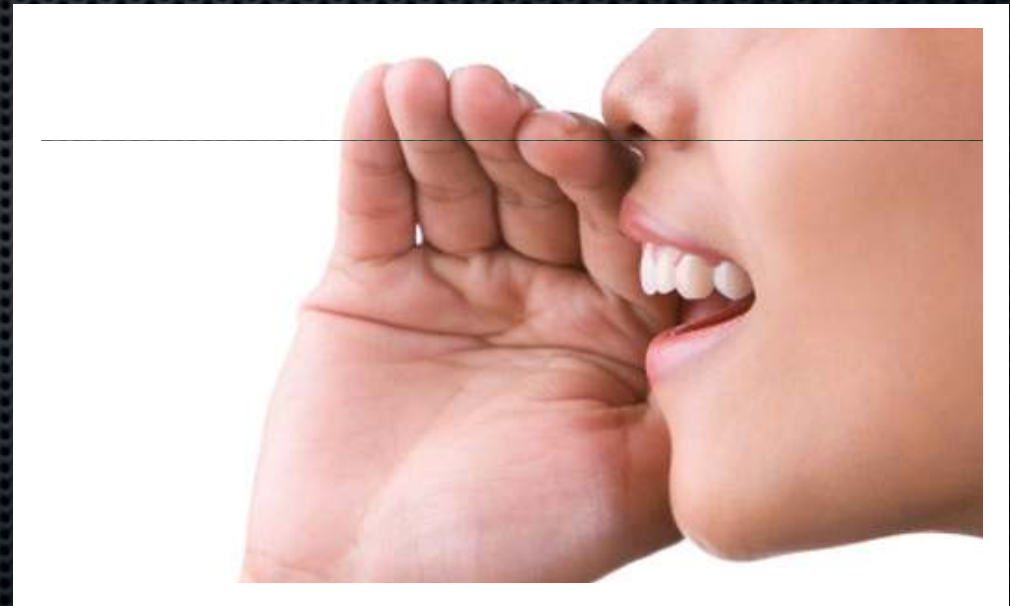
- requirements

- mood



# Chatbot response

- paraphrase
- customer gender adjustment
- asking for details
- customer's personality type adjustment
  - Communicate suitably to a customer personality



# HPT recognition example

The words and phrases for HPT - Systematic	Weight
First, second, third, fourth, fifth, next, last, at last, ..	1
After the other spread out, time, on time, rank, level, systematize, ...	2

# Offer presentation examples

# Default presentation

Standard introduction text

Virtual Assistant



Chatbot: what do you mean by long stanby?  
For example you can specify capacity of  
your desired battery.  
Customer: I don't know  
Chatbot: Do you wish your mobile phone to  
have vibration alert ?  
Customer: No please  
Chatbot: Understand, maybe you want your  
mobile phone to have USB?  
Customer: Actually yes, I want that  
Chatbot: Thank you for all your requirement

Send

Offer presentation



Sony Ericsson  
Z558

\$307.00



LG KF750  
Secret

\$380.00



LG KE850  
Prada

\$331.00



Samsung ZV30

\$288.00



Philips Xenium  
9@9e

\$298.00



Sony Ericsson  
W980

\$373.00



Sony Ericsson  
C902

\$383.00



Sony Ericsson  
C702

\$374.00

Minimal product  
information

# HPT - Dominant

Respectful text



Virtual Assistant



Chatbot: what do you mean by long stanby?  
For example you can specify capacity of  
your desired battery.  
Customer: I don't know  
Chatbot: Do you wish your mobile phone to  
have vibration alert ?  
Customer: No please  
Chatbot: Understand, maybe you want your  
mobile phone to have USB?  
Customer: Actually yes, I want that  
Chatbot: Thank you for all your requirement

Send

Products adjusted to Your requirements

1 in rating



Sony Ericsson  
Z558

\$307.00

Your  
required  
parameters

Touch screen: yes  
Organizator: yes  
USB: yes

2 in rating



LG KF750  
Secret

\$380.00

Your  
required  
parameters

Touch screen: yes  
Organizator: yes  
USB: yes

3 in rating



LG KE850  
Prada

\$307.00

Your  
required  
parameters

Touch screen: yes  
Organizator: yes  
USB: yes

4 in rating



Samsung ZV30

\$288.00

Your  
required  
parameters

Touch screen: no  
Organizator: yes  
USB: yes

5 in rating



Your  
required  
parameters

6 in rating



Your  
required  
parameters

Information about  
product match ranking

The choosen  
parameters

# HPT - Inspirational

Minimal technical details  
Inpirational presentation



# HPT - Systematic

Maximum technical details

Easy to compare

In tabular format of the data



Name	Sony Ericsson TM506	Sony Ericsson G502	Sony Ericsson T303	Sony Ericsson G900	Sony Ericsson G700	Sony Ericsson W980	Sony Ericsson C902	Sony Ericsson C702	Sony Ericsson Z770	Sony Ericsson T280	Sony Ericsson R300 Radio
Photo											
Price	\$390	\$358	\$293	\$209	\$164	\$373	\$383	\$374	\$340	\$266	\$300
3G ntwork	yes	yes	no	yes	yes	yes	yes	yes	yes	no	no
GPRS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Color		Black, Red	Black, Silver			Black, Red, Brown	Black, Red	Black, Silver	Black, Red, Brown	Pink, Black, Red, Brown	Black
Network	GSM 1800, GSM 1900, GSM 850, GSM 900, GSM 2100	GSM 1800, GSM 1900, GSM 900, GSM 2100	GSM 1800, GSM 1900, GSM 850, GSM 900	GSM 1800, GSM 1900, GSM 900, GSM 2100	GSM 1800, GSM 1900, GSM 900, GSM 2100	GSM 1800, GSM 1900, GSM 850, GSM 900, GSM 2100	GSM 1800, GSM 1900, GSM 850, GSM 900, GSM 2100	GSM 1800, GSM 1900, GSM 850, GSM 900, GSM 2100	GSM 1800, GSM 1900, GSM 900, GSM 2100	GSM 1800, GSM 1900, GSM 850, GSM 900	GSM 1800, GSM 1900, GSM 850, GSM 900
Alert type	AAC, Polyphonic, MP3	MP3, Polyphonic	Polyphonic, MP3	Polyphonic, MP3	Polyphonic, MP3	Polyphonic, AAC, MP3	MP3, Polyphonic	MP3, Polyphonic	MP3, Polyphonic, AAC	MP3, Polyphonic	AAC, Polyphonic, MP3
Resolution width	1600px	1600px	1280px	0px	0px	2048px	640px	2048px	1600px	1280px	640px
Resolution height	1200px	1200px	1024px	0px	0px	1536px	480px	1536px	1200px	1024px	480px

# HPT - Assurant

## Virtual Assistant



Chatbot: what do you mean by long standby?  
For example you can specify capacity of your desired battery.  
Customer: I don't know  
Chatbot: Do you wish your mobile phone to have vibration alert?  
Customer: No please  
Chatbot: Understand, maybe you want your mobile phone to have USB?  
Customer: Actually yes, I want that  
Chatbot: Thank you for all your requirement

Send

## Your satisfaction is our priority

**Sony Ericsson 2558**  
warranty: 2 years  
\$307.00

**LG KF750 Secret**  
warranty: 2 years  
\$380.00

**LG KE950 Prada**  
warranty: 2 years  
\$331.00

**Samsung ZV30**  
warranty: 2 years  
\$288.00

**Philips Xenium 9@9e**  
warranty: 2 years  
\$298.00

**Sony Ericsson W980**  
warranty: 2 years  
\$373.00

**Sony Ericsson C902**  
warranty: 2 years  
\$383.00

**Sony Ericsson C702**  
warranty: 2 years  
\$374.00

**Still Need Help?**  
For additional customer support please contact Kate Roberts at [support@thewinningpage.com](mailto:support@thewinningpage.com)

**Rest Assured**

**Satisfaction Guaranteed**  
If you're not satisfied with any item, return it anytime within 365 days for an exchange or refund of its purchase price.

**Privacy**  
We will not share or trade online information that you provide us (including e-mail addresses).

**Security**  
All personal information you submit is encrypted and secure.

Contact information

Rest assured certificates and badges

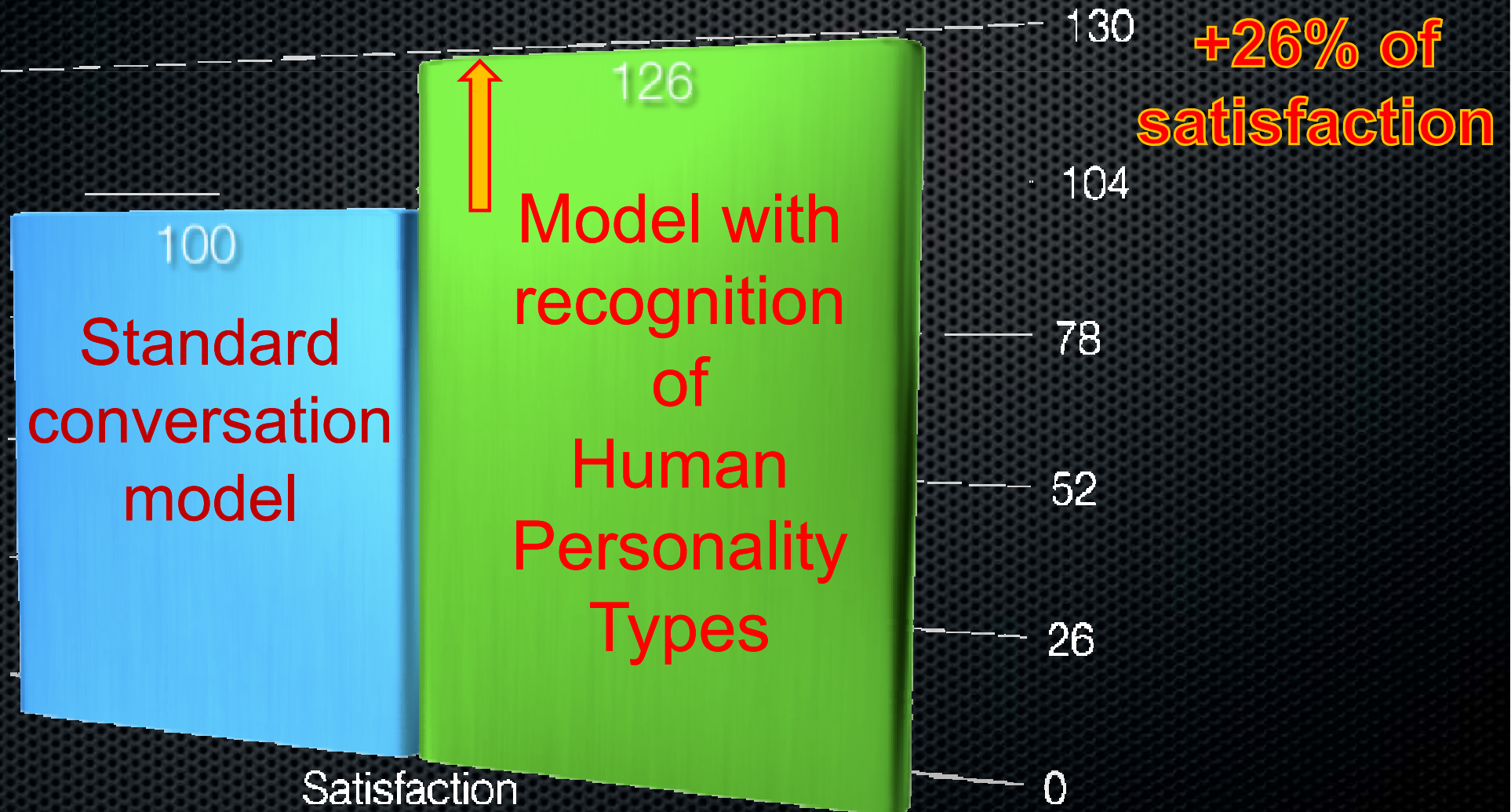
# Test scenario

- User satisfaction (ISO 9241)
- Same task for each person
- Control group
- Experimental group
- Survey

$$SatisfactionImprovement = 100\% * \left( \frac{ExperimentalGroupPoints}{ControlGroupPoints} - 1 \right)$$

# Results

Control group Experimental group



# Summary & Conclusion

- E-shop operated by a chatbot
- Significant role of a personality sensitive interface
- Intelligent approach to a customer
- Recognition of a customer's Human Personality Types (HPT)
- Implementation of a self-adaptive mechanism
- Proven improvement of customer satisfaction
- More intelligent impression during conversation to a chatbot that better understand human needs

Thank you  
for your patience and attention!

Can we clarify something?

Adrian Horzyk - [horzyk@agh.edu.pl](mailto:horzyk@agh.edu.pl)  
<http://home.agh.edu.pl/~horzyk>

Stanisław Magierski - [smagierski@gmail.com](mailto:smagierski@gmail.com)

Grzegorz Miklaszewski - [mail@gmiklaszewski.pl](mailto:mail@gmiklaszewski.pl)

IIS 2009 Cracow