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SUMMARY OF THESIS

Vanda Daniella Harmat

Sensemaking processes generated by human-HR chatbot interaction in the organization

Supervisor:

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Institute of Management
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1. Recent research and relevance of the topic

The investigation of the effectiveness of tools used to automate organizational processes was examined by several international (Willcocks-Lacity-Craig, 2015; Fernandez-Aman, 2018; Papageorgiou, 2018) and Hungarian (Kő-Fehér-Szabó, 2019; Marciniak-Móricz-Baksa, 2020; Demeter et al., 2020; Horváth, 2020) studies, however, the consideration of social aspects are also becoming more widespread in technology-related research, based on the theory of social interface, according to which people react to technology-mediated communication as if it were their partner (Mehra, 2021, p.1.). Such artificial interactions are also carried out by chatbots, which can create the feeling of a social situation during the interactions (Nass-Moon, 2000), thus generating several challenges for both the interface developers (Følstad-Brandtzæg, 2017) and the organizations in terms of the chatbots' adaptation (Brachten-Kissmer-Stieglitz, 2021).

One of the research challenges of the near future is to understand the impact of human-chatbot interaction on the behavior of individuals, as Skjuve et al. (2019) argue that in the future it may be impossible to distinguish between the natural and AI-based interaction partners. The concept of chatbots was inherently generated by the dilemma of whether it is possible to create an interactive agent that can mimic human interaction, which also raises several ethical issues for organizations, including whether a company can implement such chatbots without being transparent to the employees that they communicate with a chatbot. Even today, competitions are held, including the Loebner Prize, to test the capabilities of the most popular chatbots. However, Skjuve et al. (2019) ask whether people need such anthropomorphic interactive agents.

Within the literature on human-chatbot interaction, several publications have examined attitudes toward chatbots, including expectations, satisfaction, attitudes, perceptions, trust, acceptance, and motivation to use a chatbot (Rapp-Curti-Boldi, 2021; Kenesei- Bognár, 2019; Seer-Vizeli, 2019), but most of these articles studied the phenomenon from the perspective of the general user (experimental subject in a laboratory environment) and the consumers (customers of existing companies). In an organizational context, from the perspective of managers (Jang-Jung-Kim, 2021) and employees

(Brachten-Kissmer-Stieglitz, 2021), the phenomenon is underexplored. Managers play a central role in decision-making and communication about the organizational adaptation of chatbots, thus incorporating their point of view is important (Jang-Jung-Kim, 2021). It is also crucial to understand employees' perspectives, as factors influencing their willingness to use the technology play a key role in the success of the organizational implementation of chatbots.

This research gap, my concept of chatbots as defined by my philosophical standpoint, according to which I interpret interactive agents not as a reality that exists independently of us but as entities formed as a result of sensemaking processes, and the sensemaking perspective I have learned during reviewing constructivist theories (Weick, 1995) led to the definition of the *intellectual goal* of my thesis, which is to discover **what sensemaking processes are generated by the interaction between the individual and the HR chatbot** which I examine through the following research questions:

1. What sensemaking processes does the interaction between the individual (employees/HR professionals/managers) and the HR chatbot generate in the organization?

1.1 What sense do individuals (employees/HR professionals/managers) make of the HR chatbot used in their organization?

1.2 How does the sensemaking of the HR chatbot affect the behavior of individuals (employees/HR professionals/managers) towards the HR chatbot itself?

1.1 Conceptual framework

The creation of a conceptual framework makes it possible to clarify the elements of the research question and to show how they are related to each other.

I mean the following by the term chatbot based on Brandtzaeg-Følstad (2017) and Kenesei-Bognár (2019), chatbots are computer programs that can communicate with a user without human intervention based on pre-written scenarios and rules through a chat interface.

Based on Dautenhahn (2012), I define human-chatbot interaction as follows: the human-chatbot interaction research area explores people's attitudes towards chatbots intending to use the acquired knowledge to develop chatbots that enable efficient functioning, and at the same time, are acceptable for people, consider their social and emotional needs, and respect their values when interacting with them.

Finally, I define the sensemaking process following the definitions of Weick (1969, 1995), Louis (1980); Cornelissen (2012) and Maitlis-Christianson (2014) as follows. Individuals reduce the ambiguity caused by the discontinuity resulting from ecological changes in the organization with retrospective sensemaking. That is, individuals interpret the discrepant cues from their environment and place these cues into their existing cognitive schemes, seeking to create plausible explanations for a new, unknown, confusing organizational phenomenon. This, in addition to reducing uncertainty, is also shaping their actions.

According to the definition of chatbot I follow, a virtual agent is an artificial entity that can interact with individuals without human intervention. Due to this feature of the technology, its organizational appearance can be interpreted as an event causing equivocality that can induce a sensemaking process to reduce uncertainty. Exploring the meanings that emerge as a result of this process is important because it lets us know what characterizes effective human-chatbot interactions that respect people’s values, are acceptable to them, and take their social and emotional needs into account.

2. Methods

My philosophical standpoint determines the formulation of the research problem and the way I answer my research questions. In my thesis, I conduct qualitative research, the basic premise of which is that reality is a social construction, and its goal is a deeper understanding of a phenomenon or human behavior (Constantinou-Georgiou-Perdikogianni, 2017). Qualitative research aims to understand social events, roles, groups, or interactions through the analysis of context-sensitive and detailed data (Locke et al., 1998). The phenomenon is understood through the exploration of the subject's point of view and the meanings they attribute (Marshall-Rossman, 1989).

I created my research plan based on Maxwell's (1996) interactive, qualitative research model. The elements of the model are the research goals, the conceptual framework, the research questions, the methodology, and finally the validity of the research, which components form an integrated unit. The two triangles shown in the model indicate the main relationships between the elements. Research questions play a central role, which should be clearly related to the research objectives and should be formulated based on existing knowledge of the examined phenomenon. Research goals must reflect existing theories and scientific results. The lower triangle indicates the need to integrate methodology, research questions, and validity. The methodology chosen should be appropriate to answer the research questions and ensure the validity of the research. Research questions should be formulated in such a way that the methodology is feasible and that the validity of the research is met. It is important to highlight that Maxwell's (1996) model is flexible, which means that elements of the research plan can be revised at any time during the research process. It is typical that the research question is reworded several times, for example during data collection or data analysis.

2.1 Data collection

In my research, I *use the semi-structured interview*, which is the most common type of qualitative interview among researchers (Alshenqeeti, 2014). Similar to a structured interview, the topics and questions of a semi-structured interview are planned in advance by the researcher but may differ from

the outline and need not be rigidly adhered to (Adhabi-Anozi, 2017). The semi-structured interview allows for the realization of reciprocity between the interviewee and the researcher (Galletta, 2013), as well as the asking of follow-up questions based on the answers given by the subject (Kallio et al., 2016).

2.2 Data analysis

In my research, I apply the *interpretive phenomenological analysis* (IPA), which is a qualitative data analysis method aimed at exploring experiences in as much detail as possible and understanding how the individual interpreted them. The IPA is stemming from the UK, the first article is attributed to Smith (1996). Most of the IPA research was born in the field of psychology, but the method is also increasingly used in market research. Interpretative phenomenological analysis is related to hermeneutics and phenomenology, the essence of which is that "the experiences of individuals can only be interpreted in their context" (Kassai-Pintér-Rácz, 2017, p.28.).

The IPA begins the data analysis with a literal transcript of the interview texts, in which it also marks the reactions given by individuals (laughter, silence, etc.). The next step is to "immerse oneself in the data" by reading the texts multiple times, during which the researcher "picks up the subjects' shoes". During the reading, the researcher "makes descriptive, explanatory, interpretive and conceptual notes on the right margin of the transcript" by analyzing his free content line by line (Rácz-Kassai-Pintér, 2016; Smith-Flowers-Larkin, 2009 quotes Kassai-Pintér-Rácz, 2017, p.31.). A conceptual note aimed at a more general understanding of the interview follows. In this phase, the Gadamer dialogue takes place, ie a dialogue between the researcher's prior knowledge and what the interviewee says, with the aim of understanding the subject's interpretations. The next step in the analysis is to create the unfolding topics, that is, what the subject tells the interviewer is broken down by the researcher from a different perspective than the point of view that appears in the interview. When creating the unfolding topics, it is not the vocabulary of the subject that is used, but that of the researcher, which is written in the left margin of the transcripts. The researcher then has the opportunity to incorporate constructs that were

not used by the interviewee. As the next step in the analysis, we look for connections between topics, identifying superior topics that cover multiple topics, with the aim of exploring patterns. The researcher should assign quotes from the interview text to the unfolding topics. Thus, IPA allows double interpretation, as the researcher interprets how the subject interpreted his / her experience of the given phenomenon, and then makes a conscious systematic interpretation in order to create the unfolding themes (Rácz-Kassai-Pintér, 2016).

In addition to the primary data collected using semi-structured interviews, I also analyzed secondary data (with web content analysis and document analysis) to ensure data triangulation, namely the organizations' strategic objectives related to the HR chatbot that was available on IBM's website and in an online document published by the organization in German. Both web content analysis and document analysis were performed using inductive content coding.

2.3 Sample

I conducted my empirical research at Siemens AG's Hungarian organizations (Siemens Zrt, Healthcare, Mobility, Evosoft, Energy). In November 2019, Siemens' Hungarian organizations introduced a pilot version of the currently used HR chatbot. Siemens AG launched its HR chatbot called **CARL** (**C**ognitive **A**ssistant for interactive user **R**elationship and continuous **L**earning) in 2016 to provide a digital assistant to meet modern information retrieval needs by replacing the previously existing corporate intranet pages. The need for an HR chatbot has also been triggered in the organization to significantly reduce the number of inquiries received by the HR department, thus contributing to the reduction in the workload of HR professionals arising from responding to redundant inquiries.

As discussed earlier (6.6.1), the IPA methodology suggests that the sample should not be too large. Smith-Flowers-Larkin (2009) recommends a sample of 4–10 people for doctoral research, which, according to the authors, still "allows for detailed analysis and is still suitable for describing the similarities and differences between individual cases" (Rácz-Kassai-Pintér, 2016, p.322.). Following

this methodological recommendation, I formed three homogeneous study groups of 4-10 people. The first group consists of HR professionals involved in the development of CARL (6 subjects), the next study group includes the general users of CARL, i.e. employees of the organization (10 subjects), while the third group consists of managers involved in the implementation of CARL (4 subjects). The number of subjects in the sample proved to be sufficient, as redundant information appeared during the conversation with the 20 interviewees, so the theoretical saturation was realized. On the one hand, the sample was selected on the recommendation of the company contact, considering the perspective of the three different study groups in line with the practical objective of the research, and on the other hand, the members of the research groups also recommended additional interviewees. The contact person directed me to individuals who had developer or user experience with CARL, while the snowball method also allowed me to reach employees who had no information about the chatbot at all or had very little knowledge of the technology. All this allowed different perspectives to be learned within a homogeneous group. In addition, an important aspect of compiling the sample was for subjects to work in different jobs and at organizational levels.

3. Results

My thesis aimed to answer the question of what sensemaking processes the implementation of the HR chatbot generates in the organization, i.e. what meanings HR professionals, employees, and managers make of the virtual agent and how this meaning shapes their actions towards the chatbot. As a result of the data analysis, it became apparent that for some subjects, the organizational introduction of the HR chatbot did not mean an ambiguous event that would have interrupted their continuity. Consequently, in their case, CARL did not induce a sensemaking process, so for these subjects, I only had the opportunity to explore how they interpret the virtual agent.

The first study group was represented by HR professionals whose responsibilities included developing CARL. In the current phase of technology introduction, I have uncovered three meanings that HR

professionals made of the chatbot, as follows: (1) strengthener of professional commitment, (2) Google search engine, (3) HR digital assistant. Within these meanings, I discovered more sub-meanings. In terms of actions, it became apparent that experiencing the chatbot's organizational presence as a professional commitment strengthener resulted in the joyful care of the virtual agent, but framing it as a Google search engine resulted in a restored meaning (Sandberg-Tsoukas, 2015), so there was no identifiable action in this case. Finally, the HR digital assistant meaning resulted in two types of actions: some subjects consistently directed organizational users to CARL, but other HR professionals were inconsistent and offered employees this option only when they were busy.

In the current phase of the technology adoption, three meanings could be identified, including the (1) self-service system, the (2) operation facilitating tool, and (3) the HR assistant. Within these meanings, further sub-meanings have emerged. The chatbot as a self-service system led to the regular use of the technology, trying it out, learning its functions, and teaching it, and the rejection of use. Interpreting it as an operation facilitating tool resulted in the regular use of the chatbot. Two meanings of the interpretation of CARL as an HR assistant have shaped the actions of individuals towards the virtual agent, using the technology occasionally and in special cases.

In the case of the managers involved in the implementation of CARL, I aimed to find out how the meanings they make of the chatbot shape their expectations regarding the actions of the employees towards the virtual agent. In the case of this study group, three meanings have emerged as a result of the data analysis: (1) a tool for transformation, (2) a tool for keeping up, and (3) an infotainment. There was an expectation for employees to use CARL as a primary communication channel, and for the HR professionals to explain its benefits, to continually improve, to rethink business processes, and to organize the resource requirements required for this rethinking. In terms of the actions of HR managers, change management has been formulated as an expectation. From the interpretation of the chatbot as a tool for keeping up, the HR department has been expected to convince employees to use the technology,

constantly update its background information, and strengthen its promotion. The decision-makers were expected to make CARL available to the entire organizational staff.

Finally, interpreting the chatbot as infotainment has created the expectation that employees should use the site even if they do not have a specific goal, using CARL for entertainment. In connection with this, the HR department is responsible for the daily education and development of CARL following user needs.

It is also interesting to compare the similarities and differences between the meanings made by the three study groups. The professional commitment of a group of HR professionals is enhanced by the chatbot, and some organizational users have framed CARL as a self-service system. Both meanings bring with them learning and everyday actions toward the chatbot. These meanings coincide with the manager's interpretation and associated expectations that chatbot is a tool for transformation and requires continuous improvement from HR professionals and regular use from employees. HR professionals' interpretation of CARL that the chatbot is an element of digitalization is also congruent with managers' interpretation according to which the chatbot is a tool for keeping up. A group of HR professionals have placed CARL on their mental map as an HR assistant, and the same meaning was made by general users (a rudimentary tool). HR professionals' interpretation that CARL is a Google search engine is also similar to the interpretation of general users (search page). The chatbot has been also interpreted as an operation facilitating tool for employees, which also coincides with the experience of HR professionals, namely that CARL helps them. However, none of the meanings provided by the other two study groups coincided with the managers' objective of using CARL as an infotainment tool.

The analysis of the data also showed that the research subjects experiencing the equivocality of the technology did not necessarily associate negative emotions with the HR chatbot, as meanings with

explicitly positive content (a tool for strengthening professional commitment and self-service support tool) were identified, which resulted in active use of technology. It has also been outlined that the obviousness experienced about the implementation of technology can lead to two types of action, similar to the behavior of individuals experiencing equivocality, i.e., a neutral attitude towards the chatbot can also result in usage. In summary, perceiving the equivocality of technology is not necessarily inconsistent in terms of achieving an organization's objectives related to CARL, and a neutral attitude to obviousness does not necessarily result in employee behavior that supports goal-matching (Table 1).

Table 1 Interpretation of technology introduction and correlation of actions

Interpretation of the event	Attitude	Action	Example
Experiencing equivocality	positive	regular use	tool for self-service
	negative	rejection of use	tool for rejecting self-service
Experiencing obviousness	neutral	use	project
	neutral	avoidance of use	a tool to help with HR topics

Source: own edition

In addition to exploring the meanings, an important aspect of the data analysis was how meanings were changed during the use of the technology. The results showed that the initial neutral attitude towards the chatbot may have turned positive with the experience gained with the artificial entity, which may have led to positive meanings, which led to the joyful use and development of the chatbot. The initial openness and positive reception regarding CARL remained in the case of the affected subjects, i.e. it seems that the subsequent use of the technology did not result in any negative meanings among those who had positive interpretations in the initial technology adoption phase.

A group of subjects was characterized by a lack of change in their neutral attitude to the technology as a result of their subsequent experience, no sensemaking process was induced. This is because they had

little interest in CARL and did not feel they should pay attention to the technology. A further explanation among HR professionals is that they also saw CARL as one of their other tasks, not framing it as a special thing. Finally, the attitudes of some subjects did not change during the later stage of technology use, due to their lack of knowledge about the chatbot, fear of the virtual agent, or previous negative beliefs about it.

The personal objective of the research, in line with Dautenhahn's (2012) definition of human-chatbot interaction, was to find out what characterizes human-chatbot interactions that, while ensuring efficiency, are acceptable to people, take their needs into account, and respect their values. Based on the results of the study, it became apparent that the organizational appearance of a chatbot reinforced the need for social interaction between HR professionals and general users (employees) because of the fear of losing it. Based on the research, it has been outlined that task-oriented

human-chatbot interaction is acceptable for employees, as long as the possibility of communication with each other is provided. This is because employees need to be able to share their difficulties with HR professionals, and HR professionals would like to provide help that is more about human connectivity than operational support, so creating it is not inconsistent with organizational goals.

The sensemaking processes generated by HR chatbots have not been previously explored by any of the publications in the databases I used. As a result of my empirical research, I have enriched the literature on making sense of technology with the following:

3) I revealed nine meanings made of chatbots,
4) I identified the actions related to these meanings.

So far, no studies have been conducted on HR professionals' perspectives on HR chatbots used to automate internal communication in an organization. My research findings contribute to the research area of human-chatbot interaction with the following:

3) I examined HR professionals' perspectives on the HR chatbot,
4) I discovered employees' (organizational users) perspectives on the HR chatbot.

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