

**Brand Humanizing  
Institute:**

**Towards a  
Human-Technology**

**Fit.**

Brand  
Humanizing  
Institute

Erasmus  
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Rotterdam

*Erasmus*

# Brand Humanizing Institute: Towards a Human-Technology Fit

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Brand Humanizer Challenge 1

FSW-135: AI: The Present and Future of Work

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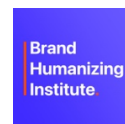
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# Preface.

In the summer of 2021, the Brand Humanizing Institute was approached by the Erasmus School of Social and Behavioural Sciences at the Erasmus University Rotterdam. Ward van Zoonen (Associate Professor) and Francisca Grommé (Assistant Professor Organisational Dynamics in the Digital Society) asked us to be one of the hosting organizations for a group of students researching Dynamics in the Digital Society.

We quickly, and without hesitation, agreed to provide their students with a research question straight from the core of our business: “*What is the impact of technology on humans in a work environment?*”

The students went to work and extracted a better, more clear problem from our main question, setting out to find an answer to challenges that arise during the socialization process of AI technologies.

The students have worked on this problem for 10 straight weeks. They showed eagerness to learn all about technology, such as Artificial Intelligence, and how we saw it impacting humans and organizations. They have non-stop informed us of their progress and were very open to new information, feedback, and suggestions. I would like to take this moment to compliment the students on their findings, and their great results and thank them for their hard work and dedication.

Also, I would like to thank Ward and Francisca, and the Erasmus University Rotterdam as a whole, for the opportunity.

– **Ferry Hoes**

Co-founder Brand Humanizing Institute

# Abstract.

Artificial Intelligence (AI) is increasingly being used by organizations. However, organizations often implement technologies for short-term benefits, while being unaware of the many implications, such as time and resources necessary, for successful implementation. This can lead to various difficulties in the long-term. This research addresses the challenge of how the Brand Humanizing Institute (BHI) can strengthen their vision towards their clients to introduce and support more long-term strategies when implementing new AI technologies in their organization. To find a solution to this challenge, six interviews were conducted with professionals in the field of technology. The interview questions were based on socio-technical systems theory and focused on technology socialization within organizations. The findings of this study reflect four important challenges that arise during the socialization process of AI technologies. These challenges include: 'overcoming uncertainty', 'considering technological readiness', 'building trust' and 'sufficient evaluation'. Based on these findings and the socio-technical systems theory, this research developed a BHI Human-Technology Socialization Model. Finally, to strengthen BHI's vision and to counter aforementioned challenges, this model is accompanied by five practical recommendations: 'determine the type of symbiosis by involving stakeholder representatives', 'provide sufficient education', 'pay attention to expectation management', 'enhance trust' and 'evaluate regularly'. By working through the different phases of the model, BHI can guide their clients through the process of technology socialization in order to obtain a Human-Technology Fit.

**Keywords:** socio-technical systems theory, socio-technical capital, AI socialization, human-AI symbiosis, technology implementation

# Introduction.

With the arrival of Artificial Intelligence (AI) in the 1950s, developments in this field have accelerated rapidly. AI can be conceptualized as “a system that displays intelligent behavior by analyzing its environment and taking actions – with some degree of autonomy – to achieve specific goals.” (European Commission, 2018). According to Toosi et al. (2021), the current ‘hype’ surrounding AI – characterized by high expectations and investments – is growing exponentially. Companies also seem to be aware of this and are eager to get on board. However, the danger of this is that, without careful implementation, replacing humans with AI can lead to various difficulties in the long term. An example of this is replacing customer service employees with chatbots. While this initially leads to cost savings and continuous availability, it could also result in growing customer dissatisfaction when not implemented correctly (Prentice et al., 2020).

The Brand Humanizing Institute (BHI), a company concerned with the issue of correct technology implementation, experiences and tackles this problem in practice. One of the challenges BHI has encountered is the short-term vision of its client’s shareholders (Flores, Hitli, Hoes and Reijnen, 2020). This vision does not coincide with their vision of creating synergy between human and technological systems within organizations in the long term, as the shareholder expectations are mainly about making (short-term) profit. Even though making a profit is an important goal for all involved parties, it seems especially important to these shareholders. Presumably as a result of technological innovation being associated with organizational success nowadays; no organization wants to fall behind. For this reason, AI is often adopted without sufficient care for employee needs. In BHI’s experience, this leads to the paradoxical problem of unsatisfied employees, resulting in reduced job performance and unsatisfied customers combined with a loss of profit. BHI is facing the challenge of convincing its clients to adopt a more long-term, sustainable approach with the risk of temporary unsatisfied shareholders. The aim of this research report is to support BHI in communicating its vision and convincing all parties of the importance of long-term investments while considering these conflicting interests. Therefore, the challenge for BHI is formulated: *“How can we support and introduce more long-term technology socialization strategies that take into account the effects on employees and customers?”*

Countering this challenge is not only important for the success of BHI as a company, but also for societal purposes. Along with the rapid technological advancements of the last decades comes a (misplaced) feeling of anxiety about technological unemployment (Fleming, 2019). This feeling is strengthened by dystopian narratives about the influence of technologies on our future working lives (Lloyd & Payne, 2019). BHI's vision that "automation should result in the further humanization of the company" (Flores & Hoes, 2018; p. 10) rather than a decline in human involvement, could possibly make a start on ending some of these fears. Moreover, it is tempting for organizations to adopt new technologies at a fast pace, by virtue of their competitive environment (Newlands, 2021). Therefore, more awareness on the topic of technology implementation and how to keep human workers in the loop, is in the best interest of society as a whole.

In order to reinforce BHI's vision, the current BHI pyramid (Flores & Hoes, 2018) will be provided with more scientific foundation and will be revised on the basis of socio-technical systems' theories. In doing so, a new segment will be added to the pyramid in which the role of technology is intertwined, the Human-Technology Fit. This will be discussed in the theoretical framework. Subsequently, the methodology section will explain which methods have been used to map the experiences of various experts in the field of technology implementation in organizations. The findings of this methodological approach will be presented in the result section, ending in a discussion and conclusion. Finally, several recommendations will be made on this topic to support BHI in communicating their vision.

# Theoretical Framework.

In this theoretical framework, the Brand Humanizing Pyramid is used as a starting point. The central concepts introduced in this pyramid represent the necessary steps for an organization (either private or public) to reach their self-determined goals, i.e., 'growth'. In the following section, the levels of the pyramid will be further explained by means of scientific literature. Subsequently, research on socio-technological systems is explored for organizations to implement technology in such a way that they find an appropriate 'Human-Technology Fit'. The introduction of this new organizational fit will help make BHI's view more convincing and more scientifically substantiated.

## **The Brand Humanizing Pyramid**

From the bottom up, the BHI pyramid levels include Company-Employee Fit, Product-Market Fit, Branding and Positioning, Company-Client Fit and Growth (Figure 1). While all the levels of the pyramid are considered essential to reach optimal growth, they do not have to be achieved in a specific order or as a step-by-step plan. Firstly, the Company-Employee Fit, also known as Person-Organization Fit, emphasizes the importance of aligning the values and characteristics of employees in an organization (Morley, 2007). This focus goes further than simply fitting the 'clinical' job requirements. Then, Product-Market Fit states that in order to accomplish growth, enough people should be willing to buy or use the product or service that a company offers. This logic relates to market supply and demand (Mueller & Thoring, 2012). Moving further up, Brand Positioning is generally defined as the way in which consumers perceive a particular brand (Avery & Gupta, 2014). Consumers form their perception of the brand from various interactions with the brand's general line of products and identity. By positioning their brand, companies seek to obtain a distinct position within a specific market (Ke et al., 2020). Then follows Company-Client Fit. This fit is important in the process of identifying a potential client; a company needs to make sure that the culture and mission of the potential client are attractive and visible (Simons, 2014). With this information, it is possible to fine-tune a product or service to meet customers' preferences. Finally, sufficiently achieving all these fits results in the fifth level: growth. Since the BHI pyramid does not include a level representing the fit between human workers and technology,

this research suggests the addition of a Human-Technology Fit based on the Socio-Technical Systems theory (Makarius et al., 2020).



Figure 1. The Brand Humanizing Pyramid (Flores & Hoes, 2018, p. 14).

Socio-Technical Systems Theory: Towards a Human-Technology Fit  
Technologies are increasingly being implemented in a broad range of organizations. Ideally, such implementations result in a synergy between the technologies being implemented and the humans working with it. Ultimately, this means that organizations make sure that technologies do what they do best, for instance, calculating and repetitive processing, and humans do what they do best, such as being empathic and creative. In order to achieve this synergy, organizations deliberately decide on where in the organization they will implement what technology, and how the implementation process will be shaped. However, it is not self-evident that organizations decide on these things after extensive consideration. For instance, private organizations may quickly decide to implement technological innovations in order to cut costs in the short-term, after being heavily influenced by the profit-related interests of shareholders (Flores et al., 2020).



Socio-Technical Systems theory as represented by Makarius et al. (2020) conceptualizes how technologies and employees together can create different levels of socio-technical capital, defined as: "... the combination of AI technology and people in organizations that leads to a source of competitive advantage for an organization" (Makarius et al., 2020, p. 265). This competitive advantage exists because the specific socio-technical interaction is embedded in an organizational culture and therefore difficult to replicate by other organizations. Mateescu & Elish (2019) call the human component in this socio-technical relationship, the human infrastructure. They emphasize that human infrastructure forms an elemental part of technology because, without their intervention, technological systems often do not function properly. Human intelligence is necessary for these systems to act intelligently.

In order to reach such added value from the synergy between technology and humans, it is important for employees to become acquainted with the to-be implemented technology; they need to be introduced to and informed about it. Makarius et al. (2020) call this AI socialization and they developed a framework that distinguishes four phases in the socialization process of AI technology in the organization (see Figure 2). The first phase considers Employee Anticipation, which involves, among other things, feelings of uncertainty and pre-entry knowledge about the to-be implemented technology. The second phase is concerned with AI- Employee Encounter and involves different levels of trust in AI. These levels of trust are also influenced by the technological readiness of employees. In the third phase Symbiotic Metamorphosis can take place; employees and AI then jointly produce goods or services. The importance of human infrastructure (Mateescu & Elish, 2019), can be included in this phase of the socialization process, since the significance of human qualities is acknowledged and plays a significant part in the socio-technical relationship. For this relationship to work, the employee should be well aware of what the technology can and cannot do. Moreover, Jarrahi (2018) describes human-AI symbiosis as complementary in the sense that "machines depend on humans when subconscious decision heuristics are necessary to evaluate the outcome of decisions" (p.10). This corresponds with the notion of phase three by Makarius et al. (2020). Hence, in this phase humans should also observe whether the AI continues to function appropriately, by means of sufficient evaluation of the implemented AI.

Finally, the fourth phase is achieving socio-technical capital. According to Makarius et al. (2020), the highest level of socio-technical capital is reached when the implemented technology is moderately novel and radically changes the work environment. Moreover, in this ideal situation, the relationship between employees and technology is symbiotic, which means that humans and technology are in a co-creating relationship. Here, humans are not only in the loop, but actively participating in the task at hand. Thus, if organizations aim to ‘humanize’ their technology implementation process and achieve socio-technical capital, they do well to integrate new technologies within existing practices, norms, and values.

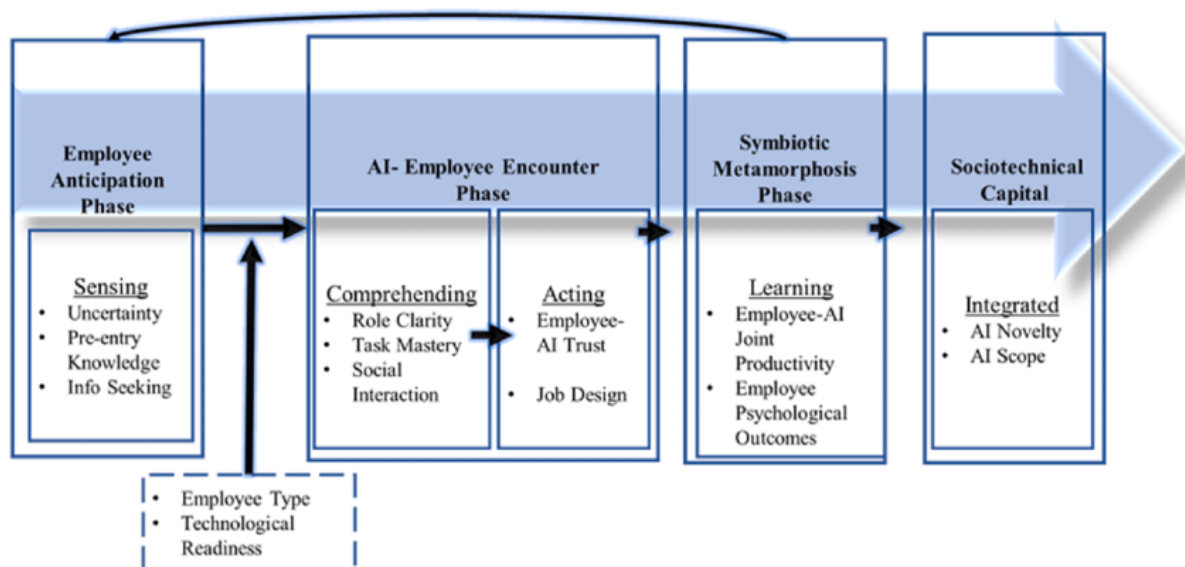


Figure 2. Systemic Framework for AI Socialization (Makarius et al., 2020, p. 267).

# Methodology.

## Data Collection

In order to find a solution to BHI's challenge, a literature review was first conducted. Literature was collected from the website of BHI and the online university library. The documents included both scientific papers, project documents and information on BHI as an organization. The literature review helped to get descriptive data and identify existing information gaps, in order to better formulate the challenge. It did not, however, give insights into actors' perceptions, so they need to be assessed by additional methods. Thus, to gain a detailed understanding of the socialization process, and the achievement of socio-technical capital, semi-structured interviews with diverse professionals in the field of technology and technology implementation were constructed as well.

Semi-structured entails that interview questions were crafted in advance, but that room is left for follow-up questions on interesting findings that came up during the interviews. Most interviews had the duration of approximately one hour, which provided a lot of information to work with. Before the semi-structured interviews were carried out, appropriate interview questions were developed to be able to operationalize the central concept of evaluation (Jarrahi, 2018), human infrastructure (Mateescu & Elish, 2020) and concepts of the socio-technical systems framework (Makarius et al., 2020): technology socialization processes, socio-technical capital and characteristics for optimal synergy (see Appendix A). With respect to the framework of Makarius et al. (2020), this study focused only on the concepts that were deemed relevant for, and corresponded with, the vision of BHI. Therefore, other concepts were not discussed in the interviews. The main goal of the interviews was to find out to what extent these professionals recognized the central concepts and examine how they try to contribute to successful technology implementation and how they carry this out in organizations.

Moreover, theoretical sampling was used to gather respondents (Bryman, 2015). This entails that the researcher specifically chooses to interview certain individuals who can make a valuable contribution to answering the research question (Bryman, 2015). The respondent group consisted of various experts in the field of technology and technology implementation.

Prior to the interviews, the respondents were informed about the purpose of the data collection, and it was made clear to them that the information provided is treated confidentially and their privacy is guaranteed. Their names have therefore been replaced by pseudonyms (see Appendix B). In addition, the participants were informed about the conditions of the study at the beginning of the interview and were asked if they gave permission for these conditions, by means of the informed consent rules (Boeije, 2014). This research thus used both document consultation combined with in-depth interviews as methods to gather data and find a solution to the challenge. Using multiple data resources allowed for verifying the data from both sources and therefore made it possible to examine whether all methods came to the same result (i.e., increasing the reliability of the study; Bryman, 2015).

### **Data Analysis**

The results were analyzed based on the concepts of the socio-technical systems framework of Makarius et al. (2020), Mateescu & Elish (2019) and Jarrahi (2018). A qualitative data-analysis on the interviews was executed according to coding processes of Boeije (2014). Firstly, first order themes were constructed through the process of open coding. These are detailed codes that have been assigned by the researcher to specific statements made by respondents. The second order themes were drawn from these first order themes by means of axial coding. The second order themes therefore were more abstract as they comprise the first order themes (Boeije, 2014). The second order themes were classified under the aggregated dimensions, which can be seen as final qualitative answers to the research questions (Gioia et al, 2012). During the coding process, the inter-rater reliability was ensured as the researchers collectively agreed upon the assigned codes (Boeije, 2014; Bryman, 2015). Furthermore, memos were written during the interviews, concerning the key concepts, quotes and themes discussed during the interviews. Consequently, these memos were discussed among the researchers of the project. After organizing the data, the data in context of the challenge was analyzed and interpreted. Finally, the solution was discussed with third parties (i.e. BHI and the project supervisor) and potential feedback was implemented to increase the credibility and ecological validity of the research (Bryman, 2015).

# Findings.

The findings of this study are presented in terms of the concepts we adopted from Makarius et al. (2020), Jarrahi (2018) and Mateescu & Elish (2019). The findings represent recurring challenges that arise during the socialization process of AI, impacting the possibility of a symbiotic socio-technical relationship within an organization. Quotes from the interviews are used to illustrate these challenges.

## Overcoming Uncertainty

With regard to uncertainty around new AI/ML technology, two kinds of attitudes are identified based on the interviews: positive and negative. Most respondents had a positive attitude towards technology implementation and did not experience a certain fear of being replaced by the technology. Some stated that AI could strengthen the organization and make people's jobs easier with more time left to focus on more interesting and fulfilling tasks.

*“Of course, automation can reduce jobs, but really the purpose of it is to improve jobs, because just tedious chores like talking on the phone about PUK codes, that's stupid. But if you have an interesting or important case, then it's nice to spend time on that. Basically, it makes their job better and more fun.”* (Sophia, 27)

However, while some employees are enthusiastic about the to-be implemented technology – because they feel that it will make (their) jobs easier – other employees feel mistrust and uncertainty towards the AI/ML technology. They believe for instance that it will replace them or alter their jobs in a negative way: *“So they thought; “Then I can no longer make those beautiful trips to Romania, instead, we only have to interpret those models, that will be our job then.”* (Lucas, 33)

Ultimately, the interviewees noted that changes of jobs would be inevitable, but that this could turn out either positive (making jobs more interesting) or negative (not being out in the field as much). Moreover, pre-entry knowledge and education on AI/ML technologies can take this uncertainty away, according to Makarius et al. (2020) and interviewees:

*“Only they never expected a model to understand that, so I think you really need to invest a lot in educating people, to understand where AI can contribute and that it doesn't immediately have to mean that people lose their jobs, but that their job is more likely to change.” (Lucas, 23)*

Education on AI/ML technologies through training also gives the availability to let employees prepare themselves for the use of it. It can increase their knowledge of the technology and remove uncertainties in the Employee-Anticipation Phase. For example, through using e-learnings, where employees can already learn a lot about, and can keep up with any changes made during the process.

*“I'm trying to see if I can implement the information about the changes that are coming in e-learnings, so it's easier for employees to get a grip of the changes that are coming. And then they can read it when they have the time for it.” (Alan, 33)*

### **Considering Technological Readiness**

When technology is planned to be implemented, it is important that both organizations and employees are well prepared. At an organizational level, this is expressed by properly organizing the implementation process. Therefore, it is salient that the problem is obvious, that the problem statement is clear and defined in such a way that it is quantifiable for a computer to provide an answer to it. This is illustrated by the following quote:

*“It starts with getting an idea of what the problem actually is. And that always sounds easier than it is, because often there is an idea about what the problem should be that you want to solve, but sometimes too little thought is given to how it should be defined.” (William, 38)*

Furthermore, in order to optimize a model, there must also be something that can be optimized. Therefore, it is also important that the technological solution is fed with enough data of sufficient quality for the system to function. Gathering the right data is essential. However, Lucas (23) and William (38) both experienced that in most companies, the current data management is of a very low level, and sometimes even non-existent. The given input of AI is not adequate yet to do what it should do, and therefore not functioning optimally: *“And indeed, the data is just really bad right now. In other words, if they implement it, it will not lead to better results.” (Lucas, 23)*

During the implementation of technology, there is an important role for expectation management of organizations. In this respect, it is important that the expectation management is not based on hype created by the media or other third parties. Respondents from the interviews highlighted that many organizations underestimate the time, effort and resources needed to implement and socialize new technology. This leads to unrealistic expectations on when the new technology generates profit (e.g., managers or shareholders striving for short-term profits while technology experts emphasize that a lot of time and money needs to be invested before the technology generates profit in the long-term). Obtaining correct information regarding the technology is therefore essential. The disappointing results and side effects of incorrectly set up expectation management can be illustrated with the following quote:

*“In the beginning, not much was done about expectation management and then things were often found disappointing, because people read all kinds of things in the newspaper and think 'AI can do everything', and then it is sometimes disappointing what actually can be done in practice.” (William, 38)*

All in all, as William (38) stated, it is important to keep asking the right questions: *“Getting an answer is very easy with the algorithms that are available, but whether it actually helps you is determined by whether you have asked the right question and therefore answered with the right method.”*

### **Building Trust**

Sometimes there can be resistance at the beginning of the implementation process of AI, especially when employees start to work with the new system, and they encounter changes in their way of working. However, trust in the adequate workings of AI can grow when employees interact with the new technology and see the benefits of this new way of working, for instance when it makes their work easier, less repetitive and hence more interesting.

*“...Any change comes with resistance in the beginning and as people become more familiar with it [the new technology] and thus see the benefits, then it would also become more accepted. People only see the benefit of a change when they get something in return, especially in the case of changes in work systems.” (Alan, 33)*

In addition, complete trust cannot fully be given to, for example, chatbots. There is still a need to check the outcomes and suggestions given by the chatbot. Humans are essential in decision-making processes regarding the predictions of the chatbot, its independence and the analysis of its outcomes: “... we still have to approve everything [that the chatbot does].” (Alan, 33)

### **Sufficient Evaluation**

A high level of socio-technical capital implies sufficient attention regarding the human infrastructure of an organization during the implementation of new technologies (Makarius et al., 2020; Mateescu & Elish, 2019). During the interviews, several respondents emphasized the importance of employee involvement in some shape or form. As Sophia (age 27, Chatbot conversation designer & Natural Language Processing specialist) said about the implementation of chatbots in support of customer service: “*Most chatbots are not at all independent yet...*”. For this reason, human input is still required.

The interviews showed that some of the respondent’s organizations had found ways to keep employees in the loop, which means that they were able to impact the workings of the technology. Moreover, the fact that these organizations placed value on their employees’ opinion, proves that they acknowledged the role of the human worker in this process. For example, by allowing employees to give feedback. Sophia (27) and Alan (33) mentioned that they even encouraged employees to speak up if the technology was not able to contribute to their work tasks.

*“You can provide workers with the freedom to make their own suggestions if they think they know better. [...] This way, you also acquire, next to the automatically generated feedback on the efficiency of your model, feedback of the workers themselves. This might add to the quality of your model as well.”* (William, 38)

Some respondents highlighted the dangers of not having adequate feedback systems on AI/ML models. Since the use of AI/ML can lead to unwanted or biased outcomes and decisions, it is necessary that there is a verification system in place. Algorithmic models constantly need to be kept up to date and receive feedback on their workings, not only because its features can switch day by day (such as the switching of prices of products and goods), but also to check whether or not the outcomes of an AI/ML model lead to unwanted decisions for end-users. For AI to work, end-user representation



and allowing them to give feedback is therefore essential, as stated by respondents Noah (45), Sophia (27) and Alan (33).

*“At the end, we ask two things to check whether [the dialogue] has helped. That's a big factor for us. We ask to what extent they have been helped with the dialogue, and feedback in the form of an CES [Customer Effort Score] – to find out how easy they found the answer they were searching for.”*  
(Sophia, 27)

In addition, it is necessary that employees who use algorithmic decision-making understand on what criteria these decisions are based on and control whether the outcome is justified or not. It is thus necessary that employees have the know-how to check the outcomes of AI/ML decisions (e.g., by means of training) and report back on the workings of a model to its engineers, who then can adjust and maintain it: “Maintaining the model takes at least as much time as creating and implementing a model. That is what many companies simply lack, maintaining the model, which also costs a lot of time and money.” (Lucas, 23). On the other hand, some respondents mentioned that they do employ an extra verification on the outcomes of a model and use their human intelligence to decide otherwise:

*“But within the software, [...] employees always had the option to just say, “I'm not doing this. It's nice that the algorithm says B, but I think it should be C”. [...] The employees therefore always had the idea that they were not just stupidly executing what the computer said, but that they were in control. [...] In fact, we want you to keep thinking for yourself and tell us if you think something doesn't make sense. I think that also values people.”*  
(William, 38)

# Discussion.

The findings of our research have illustrated that there are different aspects that need to be taken into consideration when adopting new technologies into organizations. These aspects can be linked to the AI socialization model of Makarius et al. (2020). In what follows, the findings will be discussed in relation to the different phases present in this model; employee anticipation, AI-employee encounter, metamorphosis and finally the creation of socio-technical capital. Furthermore, additional findings not included in the socialization model are discussed.

## **Theoretical Implication**

In line with Makarius et al. (2020) socialization model, this study found that uncertainty about and trust in the technology, as well as technological readiness were all recognized as important factors of technology implementation. These factors correspond with the Employee Anticipation phase and the AI-Employee Encounter phase (Makarius et al., 2020). Here, it was striking that the respondents themselves did not report any feelings of uncertainty or distrust. This might be due to them being familiar with the field of technology or the fact that they were part of relatively young organizations and therefore more open to the idea of innovation. However, they did recognize these feelings in their environments.

As for technological readiness, this study adds expectation management as an important factor. All the respondents talked in some form about expectation management towards organizations and their customers. Since organizational departments are often separated between development, training and deployment, underestimations can occur with respect to the level of human effort, time and money necessary to produce, implement and socialize AI services. Newlands (2021) emphasizes the danger of an overly optimistic view of AI, which can be fueled in the 'organizational backstage' by AI vendors and distorted media depictions of AI. This resembles the theory of Makarius et al. (2020) wherein Technological Readiness mediates between the Employee-Anticipation and AI-Encounter phase, wherein pre-knowledge and uncertainty are crucial in forming an organization's perception towards AI.

In addition, creating trust from seeing the benefits of AI, and the importance of evaluation were often mentioned by respondents. Especially in the form of an external feedback loop where end-users have the possibility to evaluate the workings of the technology. These could provide developers with valuable information on how to improve the technology and make it more user friendly. The role of evaluation could be linked to the Symbiotic Metamorphosis Phase (Makarius et al., 2020), since it highlights a socio-technical interaction in which humans and AI jointly produce and improve a product or service. It is in part through this evaluation that organizations can strive for symbiosis. Finally, the importance of human infrastructure (Mateescu & Elish, 2019) was mentioned throughout all interviews which emphasizes the essential part of the human worker within the socio-technical relationship.

### **Practical Implications: A BHI Human-Technology Socialization Model**

In order to strengthen the vision of BHI, this paper proposes to add a sixth level of the BHI pyramid: the Human-Technology Fit (see Figure 3). Adding this layer at the bottom of the pyramid shows that human-technology interaction is fundamental to the potential growth achieved by an organization. In order to achieve the Human-Technology Fit, a BHI Human-Technology Socialization Model is designed (see Figure 3). This model is built on the socio-technical systems theory and the theoretical implications of our research; using the different phases of the AI socialization model of Makarius et al. (2020), while incorporating the notions of human infrastructure (Mateescu & Elish, 2019), evaluation (Jarrahi, 2018) and organizational backstage (i.e., expectation management; Newlands, 2021). Presenting and working through the BHI Human-Technology Socialization Model with clients will help BHI to go about brand humanizing organizations in a systematic fashion. However, while working through the different phases, different challenges can occur – as our findings suggested. The rest of the section provides recommendations with respect to preparing for the AI socialization process and the different phases.

### ***Determine Type of Symbiosis by Involving Stakeholder Representatives***

First, not every job offers the opportunity to build an optimal socio-technical relationship. This has to do with the nature of the job and the technology, which is endorsed by the theory of Makarius et al. (2020). Before technology implementation, it is therefore necessary to look at the technology in question, the task itself and the way the human infrastructure is organized. Depending on this, it can be determined which relationship is desirable and

feasible in the socialization process to strive for. As a result, accurate expectation management can also be drawn up. Furthermore, it is advised to involve representatives of important stakeholders early in the process to get a clear picture of the problem that needs to be solved by AI. In other words, if AI is the answer, what was the question? Thus, it is important to not only talk about the group for which the AI technology is supposed to be a solution, but also talk with them.

### ***Provide Sufficient Education***

Regarding the Employee–Anticipation phase of the BHI Human–Technology Socialization Model, it is recommended to provide sufficient education and training on the to– be implemented technology and AI in general. Pre–entry knowledge and education on AI/ML technologies can take away uncertainty. Education on AI/ML technologies through training also gives the availability to let employees prepare themselves for the use of it. It can increase their knowledge of the technology and remove uncertainties in the first phase of AI socialization.

### ***Pay Attention to Expectation Management***

Regarding the intermediate phase, which considers the Technological Readiness of organizations, it is advised to thoroughly research if an organization has enough data of sufficient quality for the AI system to function properly. Moreover, expectation management is necessary. First, organizations do well not to let themselves be carried away by AI hype created by AI vendors and the media. Obtaining the right information about the to–be implemented technology and creating realistic expectations is essential. This includes gathering correct information on the duration, time and costs of implementing new technology. Secondly, implementing new technology in a brand humanizing way is a long–term investment, as it takes a while before the new technology is implemented and socialized well within the organization. Hence, organizations should not expect it to create revenue in the short–term.

### ***Enhance Trust by Experiencing Benefits***

Regarding the AI–Employee Encounter phase, the challenge is to build trust between employees and AI. For AI to be implemented and socialized well in the organization, it is important that tasks are clear, and that trust is developed in the beginning and during the use of the new technology. During a period of adjustment, employees can see the improvements and benefits that technology can bring to their work processes. For example, when a

chatbot can answer simple questions, humans can use their creativity to answer more complex questions. Trust can be obtained and upheld, when humans continue to stay in the loop to check the outcomes of the AI. This helps them to maintain a certain degree of control.

**Evaluate Regularly**

A final recommendation concerns the evaluation of AI, during the Symbiotic Metamorphosis Phase. It is important that there is a continuous maintenance and evaluation system in place, to check if the outcomes of the model are desired. Human input – both from employees working with the model and clients who are affected by the model – is therefore important. Herewith, a continuous external “humanized” feedback loop on the model can be created that also enriches the Employee–Anticipation Phase with new information and knowledge to improve the overall socialization process. Good communication and integration of segregated departments of an organization can help to create this continuous external feedback loop.

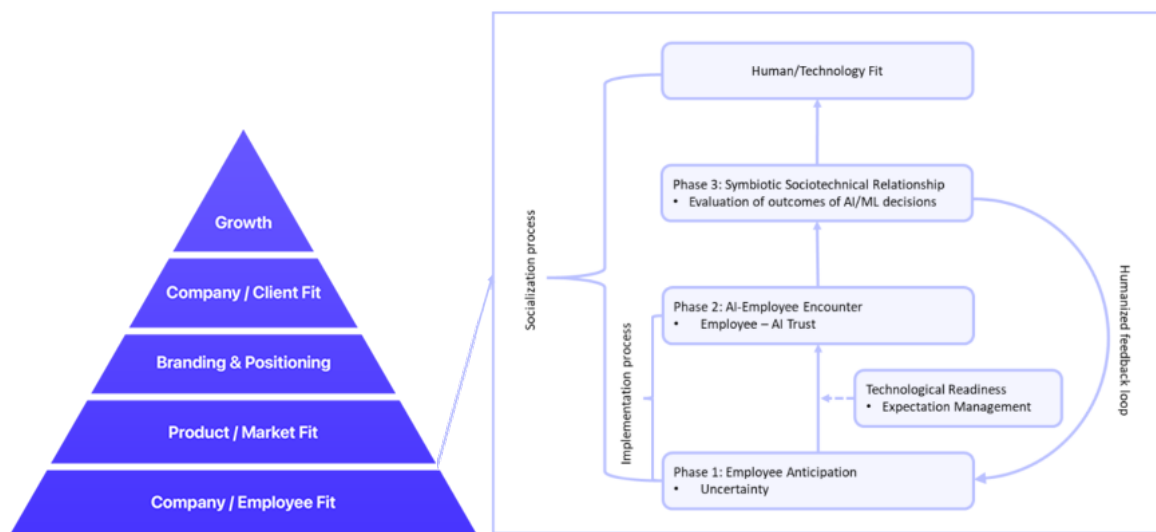


Figure 3. BHI Human-Technology Socialization Model.

**Limitations and Future Directions**

A limitation of this study is that some concepts of the framework from Makarius et al. (2020) were left out of the interview questions (e.g., role clarity), since these concepts were deemed less relevant for BHI’s vision. For this reason, other possible relevant factors for BHI were not discovered, as they were not questioned. However, these concepts could also be relevant for an adequate Human-Technology Fit. Therefore, future research could focus on how concepts such as ‘role clarity’, ‘type of employee’ and ‘task mastery’

influence the implementation process of new technology. Questions regarding 'employee psychological outcomes' and 'employee-AI joint productivity' can also possibly highlight other challenges regarding the socialization of new technology. This could provide further insights for the BHI Human-Technology Socialization Model.

Another limitation of the study is the small sample size, which prevents generalization of the results. The aim of the study, however, was to gain insight from experts into the difficulties that can arise during a technology implementation process. Despite the relatively limited sample and the exploratory nature of the study, the found results do offer valuable insights for successful technology implementation.

Furthermore, little attention is paid to the role of the client or customer. Instead, the research mainly addresses the roles of employees and employers, and appoints the challenges encountered by actors familiar in the field of AI technology. End-users who eventually are confronted with the technology are therefore underrepresented in the research. This is mostly due to the fact that the respondents are not in direct contact with them. Allowing for a possibility to construct feedback and giving voice to end-users is thus essential to obtain sufficient representation, which corresponds to BHI's holistic view of technology implementation. Moreover, future research could focus on perspectives from clients and employees without a background in AI technology, to uncover other possible challenges that are overlooked by the interviewed AI experts.

# Conclusion.

This research aimed to identify a solution to the following challenge: “*How can we support and introduce more long-term technology socialization strategies that take into account the effects on employees and customers?*”. The solution to this challenge is twofold. First, a sixth layer – the Human-Technology Fit – was added to the BHI pyramid and theoretically substantiated. Second, a BHI Human-Technology Socialization Model has been developed, describing three phases to work through in order to achieve this fit. This model is accompanied by practical recommendations to the found challenges that arise during the socialization process of AI technologies. This way, BHI can better demonstrate the importance of having a long-term vision for AI implementation to their clients and their clients’ shareholders. This solution is proposed, because in order for companies to achieve growth, it is important to be aware of the challenges arising from the socialization process of technology.

In the future, the BHI Human-Technology Socialization Model can be used to take clients through the different phases and challenges as a way to prepare them for what is to come and provide them with the necessary guidance throughout the process.

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## Appendix A

### Interview Guide

First of all, I would like to thank you again for participating in this research. I am happy to explain one more time what this research is about. Technologies are increasingly being implemented in a broad range of organizations. Ideally, such implementations result in a synergy between the technologies being implemented and the humans working with it. This means that organizations make sure that technologies do what they do best (such as calculating and repetitive processing) and humans do what they do best (such as being empathic and creative). In order to achieve this synergy, organizations do well to deliberately decide on *where* in the organization they will implement *what* technology, and *how* the implementation process will be shaped. In this research we are therefore looking at the role of technology and humans in digitalization processes and synergies between human and technological systems within organizations. We also look at *socialization* processes between the to-be implemented technology and humans.

It is important to know that all information from this interview will be treated confidentially and that you as a person will remain anonymous. If you like, we can give you a fictitious name in the transcript of this interview.

Moreover, I would like to ask if I can record the interview. I will only use the recording to transcribe the interview. I will delete the recording afterwards. In case you want to talk about something at a certain point, but you don't want this information to be included in the interview, you can simply indicate this and I will not record and transcribe that part.

The interview will take about half an hour to 1 hour. In between I will occasionally take some notes to keep the storyline of the interview.

#### **Part I: Introduction**

1. Could you tell us something about your company?
  - a. What kind of services/products do you provide?
  - b. What is your role within the company?
2. Do you know what different kinds of AI/ML technology your company uses?

- a. Can you give any examples of technology currently implemented in your work space?
- b. In what way is this technology employed?
  - i. Was there a pilot or something similar?
  - ii. Were employees' experiences mapped, if so how?
- c. Can you describe the implementation process?
  - i. When/how was it implemented?
  - ii. What is/was the reason for implementing a new technology?
- d. What are your previous experiences with using (AI/machine learning) technologies?

## **Part II: Socialization process**

3. To what extent were employees involved in the implementation process of the technology?
  - a. How were they involved and how do you feel about that?
  - b. If they were not involved, were there any complaints or struggles?
4. Did you have any training on the (basic) workings of AI? Do you know if other employees are offered such training?
5. Has the implementation of new technologies affected or changed your work in any way?
  - a. If yes, how so? Positive or negative?
6. Can you tell us more about the organizational culture and the current attitudes towards (new) technologies and innovation?
  - a. Would you say people are generally eager to learn (for example about new technologies/features)?
  - b. Would you say people generally trust AI systems? How do they express this trust or distrust?
7. How do you feel about implementing new technology in your company?
  - a. I.e., do you feel constraints or opportunities/chances?
8. Do you know if the implementation of new technology impacts job satisfaction?
9. Do you think it would be beneficial to consult a third-party on implementing new technologies?
  - a. If yes, how so? If no, why not?

### **Part III: Socio-technological Capital**

10. How would you describe the relationship between the implemented technology and employees?
  - a. What are some aspects that go well?
  - b. What are some aspects that could go better?
11. Are you aware of customer experiences with the technology? If yes, how would you describe this relationship?
  - a. What are some aspects that go well?
  - b. What are some aspects that could go better?

### **Part IV: Characteristics for optimal synergy/collaboration (?)**

12. How would you describe the expectations from the board and employees when implementing new technologies?
13. How is your company making sure that the new implemented technology is working well with the employees?
  - a. Is there a procedure to ensure that this collaboration is working smoothly?
  - b. If so, how is this procedure designed?
14. To what extent do you feel pressured to follow the most recent technological developments in your work field? (Competition with similar companies)
15. How would you describe the role of shareholders during innovation processes within the company?

### **Finally, I have a few more questions about your background (optional):**

1. How old are you?
2. What is your educational background?
3. Where do you work/in what country?

READ OUT LOUD: Thank you very much for taking part in this interview! Again, all data will be kept confidential, and you will also remain anonymous in the study. Do you have any questions left, or are there things you would like to add...?

And finally, I was wondering if you also know other people within your organization that we could possibly interview?

## Appendix B

**Table 1**

*Respondent Characteristics*

Respondent	Gender	Profession	Age
1. Lucas	Male	Data Scientist	23
2. Noah	Male	Data Analyst	45
3. William	Male	Data Science & Machine Learning Consultant	38
4. Sophia	Female	Chatbot conversation designer & Natural Language Processing specialist	27
5. Alan	Male	Chatbot developer & Trainer Customer Service	33
6. Mia	Female	Digital Marketing & Performance Lead	25