

Association for Information Systems

AIS Electronic Library (AISeL)

Wirtschaftsinformatik 2022 Proceedings

Track 16: Human Computer Interaction & Digital Assistance Systems

Jan 17th, 12:00 AM

Ambidexterity Through the Lens of Conventions? A Qualitative Study on Personal Virtual Assistants

Olivia Hornung

University of Hagen, Germany, Olivia.Hornung@FernUni-Hagen.de

Katharina Ebner

University of Hagen, Germany, katharina.ebner@fernuni-hagen.de

Karolin Kappler

University of Hagen, Germany, karolin.kappler@fernuni-hagen.de

Stefan Smolnik

University of Hagen, Germany, stefan.smolnik@fernuni-hagen.de

Follow this and additional works at: <https://aisel.aisnet.org/wi2022>

Recommended Citation

Hornung, Olivia; Ebner, Katharina; Kappler, Karolin; and Smolnik, Stefan, "Ambidexterity Through the Lens of Conventions? A Qualitative Study on Personal Virtual Assistants" (2022). *Wirtschaftsinformatik 2022 Proceedings*. 7.

<https://aisel.aisnet.org/wi2022/hci/hci/7>

This material is brought to you by the Wirtschaftsinformatik at AIS Electronic Library (AISeL). It has been accepted for inclusion in Wirtschaftsinformatik 2022 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Ambidexterity Through the Lens of Conventions? A Qualitative Study on Personal Virtual Assistants

Olivia Hornung¹, Katharina Ebner¹, Karolin Kappler¹, and Stefan Smolnik¹

¹ FernUniversität in Hagen, Chair of Business Information Systems, Hagen, Germany
{olivia.hornung,katharina.ebner,karolin.kappler,stefan.smolnik}@fernuni-hagen.de

Abstract. Personal virtual assistants (PVAs) are demanded to effectively fulfil and support employees' tasks in organizations. Today, PVAs are mainly trusted to take over simple administrative tasks, thus, limiting their potential long-term impact on employees and entire organizations. To overcome this shortcoming, we introduce the pragmatic perspective of the Economics of Conventions (EC) to analyze and understand employees' plural motives and behaviors that may explain sustained or fragmented potential PVA use in organizations, especially taking the organizational challenge of ambidexterity into account. In doing so, we provide a deepened understanding of PVAs' capabilities and give propositions for their organizational implementation and use. We also offer new avenues for future research by calling for a more holistic theoretical foundation of organizational artificial intelligence solutions that represent organizations and their employees in their complexity, respectively their plural orders of worth.

Keywords: Organizational ambidexterity, Economics of Conventions, qualitative study, interviews, propositions.

1 Introduction

One of the major challenges organizations are currently facing amidst the race for digitization is organizational ambidexterity [1], which is the ability to both utilize and exploit technologies efficiently and productively while also exploring and innovating with their help [2]. Organizations want and need to embrace ambidexterity amidst digital transformation to remain competitive and strengthen their position in the market [3]. In order to implement and utilize new technologies in an ambidextrous manner, organizational visions, strategies, organizational structures, business processes, and organizational culture have to be reevaluated, if not reinvented [4]. Thus, successful organizations do not only have to efficiently handle daily business, but also push for innovation in order to survive and thrive [5]. Managerial meetings are scheduled in an efficient manner, avoiding long breaks and minimizing travel distances for everyone – while innovation capacity is proven to benefit from creative breaks and motion in an inspiring atmosphere to gain new impulses [6]. Product development benefits from gathering, arranging, and analyzing data as well as creative ideas and innovative problem-solving [7]. The question of how organizations can align both experts who work efficiently and exploit well with innovators who prefer exploring in an inspired environment remains.

Time is one of the most important organizational resources [5] for digital change management along with organizational culture [8]. To improve and manage both vital resources along with encouraging ambidexterity, organizations could implement personal virtual assistants (PVAs). PVAs are intelligent assistants that can communicate with the users and execute several functions of human assistants. Thus, they are multi-purpose and either digitally used in the form of software, applications, websites, or in the form of independent devices [9]. PVAs can not only offer guidance for improvement as well as even conducting standardized tasks efficiently [10, 11], but also potentially structure and support innovation efforts and processes [12, 13]. They could find the optimal degree of efficiency and inspiration for meeting organization as well as moderating organizational culture and offering advice on strategic guidelines – especially regarding co-creation [14] in product development. Consequently, PVAs are potentially well-equipped for both exploitation and exploration, and, thus, can aid to manage organizational ambidexterity as a whole.

With PVAs potentially offering a solution to many organizational challenges, including managing ambidexterity, the employees as future users of such PVAs also have to be accounted for. We argue that PVA solutions intended to support organizational ambidexterity require effective use, i.e., it “helps attain the goals for using the system” [15]. Accordingly, we need to understand how and under which circumstances the interactions between user and PVA contribute to balancing exploitation and exploration. Given the sheer endless theoretical support options induced by PVA solutions, we also hold that we need to frame the interactions specifically towards the different activities related to organizational ambidexterity. Since PVAs are a type of anthropomorphic information systems [16], understanding interactions with such a system requires understanding communication with the system and valuation of its responses – the main focus of our research. However, a plurality of different registers of worth, i.e., interpretative frameworks developed and managed by actors to evaluate and coordinate action situations [17], impacts how employees come to their conclusions of viability, and, thus, form these interactions intended to contribute to organizational ambidexterity. Thus, we ask the following research questions:

- 1) How do employees perceive an organizational PVA’s role in its contribution to the goals of ambidexterity?
- 2) How do employees justify their interactions with an organizational PVA?

In the following, we propose the pragmatic framework of the Economics of Convention (EC) developed by the sociologists Boltanski and Thévenot [18] to identify different registers of worth. Each of the registers draws upon different conceptualizations of the common good, understood as the benefit or interest of all, and the corresponding values. The EC offers a theoretically and empirically proven concept to classify and understand employees’ moral motivations and behavioral justifications. In line with our research goals, the EC sheds light both on potential conflicts between different registers of worth and possibilities of cooperation and coordination. Based on several extensive focus-group discussions and an in-depth interview study, we find ambidexterity by identifying different registers of worth and potential conflicts among regarding organizational PVA use. Our aim is to find new approaches to enhance and

guide the engagement of employees with PVAs in an ambidextrous world. We provide several propositions for organizational PVA implementation and use.

2 Theoretical Background

2.1 Ambidexterity

Organizational ambidexterity can be defined as the “ability of an organization to both explore and exploit – to compete in mature technologies and markets where efficiency, control, and incremental improvement are prized and to also compete in new technologies and markets where flexibility, autonomy, and experimentation are needed” [2]. Organizational ambidexterity is positively associated with sales growth [19], innovation [20], and firm survival [21], and has become a popular research subject over the last years. There are several ways for an organization to achieve ambidexterity [2], such as sequentially (e.g. starting with exploration, then adapting to exploitation or vice versa) or simultaneously through structural ambidexterity (e.g. separate subunits for exploitation as well as exploration). The third way is contextual ambidexterity which requires a supportive organizational context and culture as it encourages employees to make own judgements on how they want to approach tasks between the conflicting demands [22]. From hereon we mean contextual ambidexterity whenever we refer to organizational ambidexterity. To solve the ongoing employee challenge of managing ambidexterity, PVAs as AI-based systems offer vast potential to not only support exploitative tasks such as invoice processing and calendar management [10] but also exploration by supporting creative processes such as design [13] or text composition [12].

2.2 Personal Virtual Assistants

AI-based systems are capable of analyzing their environment and adapting to new circumstances by applying machine learning techniques [23]. Intelligent agents as a subcategory of AI are attributed decision-making capabilities through machine learning and natural language processing (NLP) [24, 25]. Smart personal assistants, as a subcategory of intelligent agents, are especially trained to help fulfilling tasks, especially in the workplace [26]. They can also be seen as cognitive assistants [27] or companion systems [28], as they can provide decision support for users as well as executing cognitive tasks. They aim to imitate human communication and often support the interaction of human service agents and customers [29–31]. To achieve this aim they rely on speech recognition, natural language interpretation and NLP as well natural language generation. Furthermore, they try to depict knowledge that they acquire through machine learning and mimic conversations [32].

For our purpose, we define personal virtual assistants (PVAs), often also called enterprise assistants or virtual personal assistants, as intelligent assistants that can communicate with the users and execute several functions of human assistants (multi-purpose). These systems are either digitally used in the form of software, applications,

websites, or in the form of independent devices. They can also be integrated into other systems and learn over time. According to the user's preferences as well as organizational guidelines, they can also track the user's behavior and merge data from different sources, create models for relationships between people, content, and contexts, predict users' needs and preferences, and autonomously act by order of the user. This definition is generally supported in line with practical examples of PVAs [33].

We have already argued that PVAs can be used ambidextrously and potentially offer valuable support for ambidextrous work environments. But to fully grasp employee perceptions of PVAs for ambidextrous use scenarios, we need to apply a theoretical lens that offers not only the potential to differentiate between exploitation and exploration, but also offers additional avenues for explaining interactive and communicative structures between users and PVAs. Hence, we introduce the EC.

2.3 The Economics of Convention

The EC, as a general social science theory developed by Boltanski and Thévenot [18], proposes consistent pragmatic concepts for the sociological analysis of behavioral coordination. It relies on the justifications observed during ordinary disputes. This framework of justification is conceived as a theoretical research lens to study empirical conflicts. In conflict situations, actors mobilize arguments to defend their perspective. Based on field surveys and Western political philosophy, Boltanski and Thévenot [18] developed a taxonomy of the various conventions, or registers, of the "common good" mobilized by the actors. The common good – or the benefit or interests of all – directly refers to specific perceptions of justice and fairness [18]. Hence, when a conception of the common good based on one principle of justification is criticized according to criteria based on another, (potential) conflicts arise. This theoretical approach has been already used in many fields outside of IS research, while there are only few studies on the EC within IS. Choi et al. use the EC to reveal how social conventions legitimize value and provide identification in the global open source software community [34], while Hurni et al. explore how conventions dictate mergers of unequal coordination approaches in platform-based multi-sourcing [35], and Sharon uses the EC to identify how the civic convention can be incorporated the googlization of health research [36]. While the EC was found to be useful by these authors for describing how their chosen phenomena unfold, the highlighted studies are related to very distinct and compartmentalized phenomena. Our aim is to use the EC to show what is at stake in emerging conflicts and can therefore serve as the basis for exploring the potential interactions between users and organizational PVAs – beyond a purely descriptive or narrowly focused approach.

Boltanski and Thévenot [18] identified six justification registers, each based on different common goods and conceptions of values: civic, industrial, commercial, domestic, inspired, and renowned. It was expanded with two more registers, the 'project' and the 'ecological' [37, 38]. For our study, we chose to focus on the registers that best represent ambidexterity: industrial and inspired. The industrial register relies in planning and standardization to achieve efficiency and productivity while the inspired register values nonconformity and creativity aiming for originality and

innovative capacity [39]. Thus, they represent the two sides of ambidexterity: Industrial for exploitation and inspired for exploration. Additionally, we will introduce the domestic as well as the project registers as they provide additional explanations on how and why PVAs can influence organizational ambidexterity. The domestic register relies on tradition with trust and exemplary focus; the project register relies on activity and self-management to achieve successful projects [39]. Table 1 provides an overview of each of these relevant registers with their principles of justification:

Table 1. Relevant registers of worth

Register	Common good	Principles of justification
Industrial	Increased efficiency	Functionality, expertise, optimization
Inspired	Inspiration	Spontaneity, deliberation, emotion
Domestic	Tradition	Hierarchy, trust
Project	Innovation and the network	Activity, experimentation, connection

Following Table 1, there is a plurality of possible conventions or registers. The term ‘convention’ or ‘register’ in the EC does not simply mean a habit or custom [18, 40]. Rather, the concept of convention in the EC is more complex. Conventions and registers can be understood as interpretative frameworks developed and managed by actors to evaluate and coordinate action situations [41]. This does not imply that each individual is part of a particular register, nor that individuals consciously act according to the precepts of any of these mentioned [42]. On the contrary, actors, depending on interactions with others, can easily pass ‘from one register to another’ [42], e.g. attribute several registers to a single tasks assisted by the PVA. Similarly, the justifications given to each of these activities are implicit; individuals will only explain them in a conflict. Coordination requires agreement on a common principle or on the realization of an understanding, which can emerge between different registers of worth. There is no register more rational than any other to the extent that they all refer to a legitimate and immeasurable conception of the collective. The decision is not just a matter of calculation but a choice between several possible commons [39]. Each register acts as a logical, harmonious order of statements, objects, and people. Hence, Boltanski and Thévenot’s [18] typology offers an applicable framework for identifying the registers, which guide employee behavior towards organizational PVAs and their ambidextrous use.

3 Method

We conducted a focus-group and interview study to better understand the emotions the potential use of an AI-based PVA would evoke in the workplace [43, 44]. We applied a voluntary response sampling strategy [45] to arrive at a sample of 15 participants (P 01-15) between the ages of 19 and 40 years old. All participants had university degrees in business or business information systems. They were employed at the time of the data collection and were asked to refer to their current or last workplace when giving

statements regarding potential PVA use. The participants' identifier (ID) along with their age, job title/role, and place of employment can be found in Table 2. Here, we can see that the sample includes various job titles/roles (of which most are office jobs), is diverse in seniority and includes organizations from major sectors. Using a PVA in the workplace is not common yet, but the participants' previous involvement with digital technologies as part of their university studies as well as their desire to voluntarily participate enabled them to imagine and think ahead to the future, where using PVAs in the workplace could be part of their daily routine. Our voluntary response sampling strategy was non-exclusive - all participants wanting to partake were invited to do so.

Table 2. Participants' demographic data

ID	Age	Job title/role	Organization
P1	32	New business developer	Consumer goods manufacturer
P2	19	Management trainee	Automotive supplier
P3	24	IT support	State university
P4	28	Business administrator	Energy company
P5	27	Recruiter	Software development
P6	33	Software developer	Automotive supplier
P7	27	Project controller	National bank
P8	33	CEO	IT service provider
P9	27	IT consultant	Insurance
P10	25	Process manager	Medical technologies
P11	30	Organizational developer	Transport and logistics
P12	40	IT consultant	Consulting
P13	28	Corporate auditor	Pharmaceutics
P14	31	Human resources consultant	Aviation
P15	27	Flight attendant & influencer	Aviation & self-employed

We structured the data collection, which took place between October 2019 and January 2020, into two parts. First, we conducted 90-120-minute-long focus-group discussions with three groups of 4-6 participants each, who gathered and discussed tasks for which they could use a PVA in the workplace. The sessions were all moderated by one author, while another author was observing the group and taking notes on group dynamics, especially focusing on peculiarities during the group discussion. Second, we conducted 45-60-minute-long individual one-on-one interviews via telephone or video conference to follow up on the focus-group discussions. With the participants' consent, all group discussions and interviews were recorded with an audio device and transcribed shortly thereafter. The data collection took place in different cities across Germany, and focus-groups as well as the interviews were held in the participants' native language (German).

In agreement with our paper's in-depth approach and to generate rich data, we mainly asked open questions [44, 46], such as '*Which tasks would you have a PVA conduct? Which not?*' or '*Why would you see this task as easy/hard for a PVA to do?*' We conducted both the focus-group discussion as well as the interviews in a semi-structured manner. During the focus-group discussions, we ensured participants stayed

with the given topic of potential organizational PVA use, and we encouraged them to interact with each other as well as trying to reach agreement on whether the identified tasks (such as organizing meetings, taking minutes, (pre-)selecting job applicants, or planning corporate events) would be easy or hard to take over for the PVA.

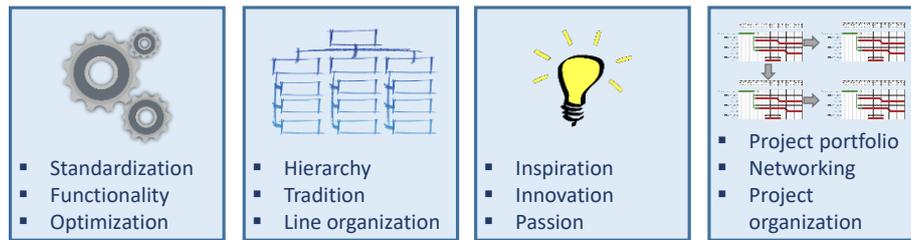


Figure 1. Exemplary interview tiles

To obtain results reflecting the different registers of worth in the individual interviews, we presented the participants with an overview of eight tiles, each representing one register. Figure 1 shows the tiles for the registers industrial, domestic, inspired, and project. During the interviews, the participants were asked to give their rank the importance of the different registers – initially, regarding the organization they work for, then regarding themselves in the workplace, and finally also with regard to using an organizational PVA at their workplace. We also encouraged them to explain their choices and wrote down their rankings visibly, giving participants a chance to reorganize their choices and reflect on them.

After we gathered our data, we transcribed the audio recordings and coded them using the registers as codes. For our analysis, we used the qualitative data analysis software Atlas.ti to analyze the full transcripts of the group discussions as well as the individual interviews. In the coding process, we included the notes on group dynamics and particularities taken during each group discussion to ensure we assigned the correct codes to each quote. Our full research process is depicted in Figure 2.

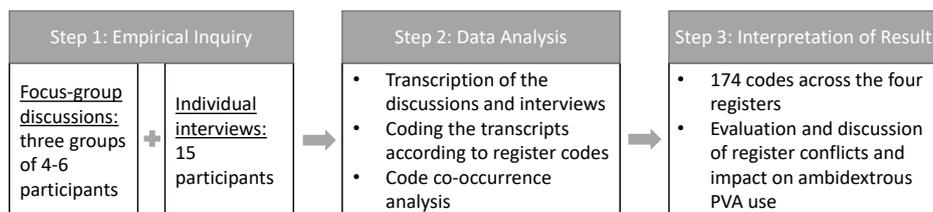


Figure 2. Research process

4 Results

Our coding processes resulted in 174 codes regarding organizational PVA use across the four different registers of worth. A majority of quotes (63%) only have one register assigned to them, while the rest has two or more registers – some of which pose conflicts while others reveal complementarity. In rare cases, we found three or four registers assigned to one single quote, showing the plurality of registers and orders of worth assigned to one single matter.

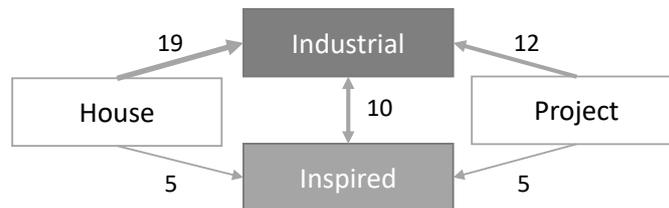


Figure 3. Frequency of registers' co-occurrence

The industrial register can be seen as a focal point of our research since it represents the exploitation-side of organizational ambidexterity. The industrial register occurred a total of 82 times, of which 19 codes co-occurred with the domestic register, 12 with the project register and 10 with the inspired register – also seen in Figure 3. The latter only occurred 20 times in total, half of which was in co-occurrence with the industrial register and five times each with the domestic and project register.

Generally, PVAs were seen as useful for standardized tasks that were deemed easy for a system to take over, as P2 states: “*Such a PVA could take over easy and not complex tasks and therewith increase efficiency, which is very helpful. And this is represented here – we can really see the easy things are not problematic.*”

Among these standardized tasks could be “*organizing meetings, booking rooms, and other administrative tasks*” (P5), where a system could “*potentially be much more efficient than any human once trained*” (P6). Our participants see the value in increasing efficiency for these tasks which they, in line with ambidexterity, would have conducted in an exploitative manner. Thus, we propose:

Proposition 1: PVAs must first and foremost efficiently relieve employees of repetitive standardized tasks.

When participants discuss more creative and innovative processes, their answers become more ambiguous. Some participants believe the PVA could potentially take over creative processes while others do not see the PVA as sufficiently capable or competent. P1 believes that “*in creative processes we can definitely use PVAs, because you can receive impulses from just collecting information – whatever the context is.*” While this example views the supply of creative input information as a creative process, P2 views a new combination of available information as equally creative as employees are: “*I think a PVA could really provide good results and supposedly be creative. [...] Theoretically, the PVA can randomly combine all data available to it and see if something gives. [...] I would say, this is no less creative than humans are.*”

For other participants, a mere search or recombination of existing information is not sufficient to believe the PVA can execute creative processes as *“there is not enough standardization. In the end, a PVA can learn but it cannot learn from nothing”* (P1). This indicates that some participants view creative and innovative processes as difficult to teach to a system such as a PVA. P13 sums this up by stating: *“When I talk about innovation, I talk about, for example, having a new idea for a new product. This is what I connect with innovation. And in this matter, I am not sure if a PVA can already bring the skills to support this. Surely it can support smaller parts such as collecting data and giving suggestions for a project name or setting up the project plan with buffers. But really coming up with own innovations – suggesting something that did not previously exist which offers a solution to a problem we struggled with in the past – is still far off.”* Overall, we can see that there is less consensus whether a PVA could execute creative or innovative tasks, but there is potential they could assist the employees conducting these tasks, especially when they have ambidextrous job roles: *“I think the PVA will indirectly also help me with inspiration. By taking over other things I might have more time to care. I think this is the most useful thing about using PVAs. If it takes over other things, I might have more time for this inspiration thing”* (P8). Hence, the PVA also enables employees to cope better with organizational ambidexterity as they can be supported in exploring. Thus, we propose:

Proposition 2: PVAs should support creative and innovative tasks, but not overtake or execute them.

Our results also reveal that participants are willing to help the PVA learn and train towards optimally supporting their tasks as they believe it cannot deliver perfect results without their input and feedback. P13 suggests that when categorizing and prioritizing e-mails efficiently, a PVA could learn *“by compiling a list with its suggestions twice a day and then I can either confirm or reject the suggestion. This way, after a short while, it will suggest the right category for at least 90 percent of my e-mails, [...] helping me save so much time.”* P14 can also imagine that the PVA can learn to offer support for innovation-motivated meetings as it will know best which *“points of intersection are to be included”* as well as *“which templates and previous finding we can build upon,”* whereas P1 is rather skeptical of training the PVA towards innovative use as *“there has to be basic data and basic processes have to be learned [by the PVA]. I find this rather hard in a creative environment and cannot really picture it to work.”*

Besides helping the PVA to learn necessary information and basic processes, our participants also emphasize the requirement for PVA customization and how a lack thereof jeopardizes employees' willingness to use the PVA: *“A PVA that is tailored towards me as an employee: that is a big issue which I still see as a difficulty at the moment and which is the reason why I often still do not use a PVA when it is offered to me. Because it simply needs to know my preferences to better react to me. I need to invest time in order to gain a bigger value later on”* (P13).

It is important for employees to be involved in a PVA's learning phase by providing feedback and customizing it towards their preferences and needs. Therefore, we propose:

Proposition 3: Employees should get the opportunity to take part in training and customizing their organizational PVA towards ambidextrous tasks.

Even though the added value in ambidextrous use is appreciated, there is uncertainty for employees as to which consequences they face, may it be their position being entirely filled by the PVA or the PVA being used as a tool to demonstrate status and superiority. This can also be seen in the following statement by P11: *“Especially where tradition is still important and a meeting culture prevails, implementing a PVA could be very efficient. The only conflict is that it takes over assistance, also personnel-wise. [...] What does an assistant for upper management do in the future or will this position not be filled anymore? Will everyone have a PVA device? Or will a PVA only be attainable for central management positions? I see lots of potential for conflict to use the PVA representing hierarchical power for those who have it.”* Other participants were also worried how organizational culture might be influenced if the PVA is implemented as a way to give more hierarchical power to supervisors: *“So when I imagine efficiency tracking, the system will definitely monitor employees. Like total surveillance. And I believe this will definitely influence organizational culture. Especially when you think about being monitored at all times. This could really influence culture negatively. And I personally think that is difficult”* (P2).

Apart from these statements which use the domestic register as reasoning, the project register also shows how deeply organizational culture matters for ambidextrous PVA use. P5 and P8 argue whether letting the PVA take over the onboarding process for new employees could be possible. While P5 sees that resources could be managed more efficiently and onboarding further exploited as *“the entire onboarding topic is really needing improvement. [...] Someone has to make time to sit beside them. This person will then be busy for two weeks just explaining all the systems. [...] And most times, it is the exact same process. I mean, the complete onboarding,”* P8 believes that getting to know new employees is vital and would rather do this explorative task themselves. P8 uses the notion of teamwork and meetings – typical for the project register – to justify why organizational culture dictates not letting the PVA execute the task of onboarding. Thus, we suggest as follows:

Proposition 4: Introducing PVAs for ambidextrous use needs to collude with and help communicate organizational culture and should not be used to demonstrate power.

Participants also showed a strong awareness for the challenges they face regarding ambidexterity and expressed these through the industrial or the inspired register. However, they agree for both exploration and exploitation that they would rather not let the PVA *“make decisions relevant for business”* (P1) or *“things that I really want to do myself”* (P9). Thus, the issue of managing (contextual) ambidexterity remains, even if implementing a PVA. Nonetheless, participants preferred to be left with this challenge or choice as they would rather actively influence the task or at least the result rather than having to face the consequences of the PVAs autonomous decision-making: *“And it always depends to what degree the systems take away decisions from me. So, when it comes to leaving the final decision up to the system, I believe that we [me and the system] will often be in conflict. [...] If the final decision were always up to me and I could say “I like this... or I don’t” or “please suggest something else” then we would be in less conflict than if I just say, “book a room for me.” And then I obtain a result and have to just live with it”* (P6). This notion also results from being unsure about the registers of worth being the same for the employee and the PVA – which is

representative for the organization's registers of worth as P6 expresses: "*There would definitely be a difference between how my employer would design a PVA and how I would design it. I would design it in a way that leaves the final choice up to the employee.*" Hence, we propose a certain degree of ambidexterity to remain with the employee and letting them have the final choice, but also the responsibility for the tasks:

Proposition 5: In line with contextual ambidexterity, PVAs should leave the final choice on tasks and decision-making up to the employee.

These five propositions provide guidelines for ambidextrous PVA use. The results show how the identified registers of worth can uncover conflicts and potentially reveal opposing requirements for PVA implementation and use in an ambidextrous manner.

5 Discussion and Outlook

Our results reveal that while participants were able to fully imagine and embrace PVAs to not only support but fully execute standardized tasks efficiently, they are reluctant to let PVAs do the same for creative and innovative tasks. PVAs are mostly seen as a replacement for administrative jobs which merely require optimization – which is in line with the current state-of-the-art of PVAs [11]. Thus, PVAs are only deemed to be a fully competent and capable team member for one side of ambidexterity – and that is exploitation. For exploration, the more creative and innovative processes and tasks, the PVA is merely seen as a small aid or second-tier support. Incorporating PVAs as full team member shows a dilemma in current research on PVAs. Our results show that PVAs are neither seen as competent enough to constitute full team members, nor would it be appreciated by the employees if sophisticated and challenging tasks would be done by a PVA. But current research suggests organizations are heading towards co-creation with PVAs [14] and the aim to develop a PVA into a real companion [28]. To facilitate this path from PVA rejection for innovative tasks, we can use the project register representing activity and teamwork. Our results show that interconnectedness is especially appreciated by participants in conjunction with inspiration and innovation to aid with the creative processes. Hence, the project register of worth can potentially moderate the effect of PVA use on managing ambidexterity, elevating the PVA's tasks from merely exploiting to also exploring – and ultimately leading to success in ambidextrous use of digital technologies [4].

Our findings regarding the willingness to help the PVA learn tasks, processes and preferences – not unlike training a new employee on the job – are complementary towards what Korteling et al. [47] found. They argue that PVAs are merely seen as systems rather than AI-partners with human-level intelligence. Thus it is surprising that our results show a tolerance for PVA errors by our participants.

Furthermore, the domestic in junction with the industrial register of worth could lead to higher trust in the PVA as well as in those with a higher position within the organizational hierarchy. Participants see potential added value a PVA could achieve through increasing trust for a fairer organizational culture [48] if it serves as a watchman of the employee-created knowledge and content. This way, a PVA can mitigate or prevent intentional misrepresentation of individual employee contributions.

Seering et al. [49] confirm this potential in their research and suggest to implement a less dyadic PVA design, not focusing on one-on-one support but rather expanding their social role to fully unleash a PVA's potential for social interaction, making PVAs worthy community members. They believe that PVAs could support richer social interactions and possibly maintain and moderate culture. This puts the domestic as well as the project register of worth between the exploitative and the explorative side of organizational ambidexterity and confirms our results.

Furthermore, the results also show that we ought to rethink our initial assumption of contextual ambidexterity [22] being the main type of ambidexterity addressed by PVA use as P6 states: *"This is why I prefer to diversify a little bit and not always work on the same tasks. [...] So, there would be a pool of generalists and a pool of specialists, and the tasks will be distributed among both."* What P6 describes here is structural ambidexterity, where separate subunits or departments with a focus on either exploitation or exploration constitute the organization [2]. Furthermore, P2 even suggest sequential ambidexterity for the implementation process of organizational PVAs: *"So I believe it would be easier to start with standardizing processes and then implement the PVA there instead of implementing the PVA for all processes as they currently are. [...] I mean, this could be a chance for the PVA to take over further standardization in the next step."* Such sequential ambidexterity assumes that organizations focus on one side of ambidexterity first before adapting over time and adjusting towards the other side [2], mostly starting with exploitation and later changing towards exploration. This could be another way of adjusting the PVAs role – from exploitation to exploration as the organization itself changes. This diversity in our results shows that there is vast potential to achieve ambidexterity through organizational PVA use.

Altogether, we hold that our research has the potential to make an important and unique contribution to research and practice. First, by basing our research in a setting that allows for ambidexterity, we overcome shortcomings of past research [28, 29] that focused on what is currently possible from a technological standpoint, namely efficient exploitation, but was less concerned with the explorative side of ambidexterity. By using a hypothetical research setting, we not only identify future use scenarios, but can also see whether employees are willing to use the PVA in for different tasks. Second, by introducing the EC into the IS field to explore and explain beyond purely describing phenomena or narrowly focusing on a single register, we open new avenues for future research which better account for ambidexterity regarding PVA use, understanding underlying user decisions and behavior. Future research could further investigate the co-occurrence of specific registers in depth through qualitative studies as well as using the EC as a lens to investigate the use or non-use of specific categories of IS, such as they occur smart cities or digital health management. Furthermore, our results are subject to limitations which can encourage further research endeavors in this promising research stream. We suggest expanding the sample to uncover further conflicts as well as confirming the conflicts we identified. Further, we have found some promising co-occurrences of registers of worth which could be tested empirically through quantitative research.

References

1. Park, Y., Pavlou, P.A., Saraf, N.: Configurations for Achieving Organizational Ambidexterity with Digitization. *Information Systems Research*, vol. 31, 1376–1397 (2020). doi: 10.1287/isre.2020.0950
2. O'Reilly, C.A., Tushman, M.L.: Organizational Ambidexterity: Past, Present, and Future. *Academy of Management Perspectives*, vol. 27, 324–338 (2013). doi: 10.5465/amp.2013.0025
3. Downes, L., Nunes, P.: *Big Bang Disruption* (2013)
4. Gurbaxani, V., Dunkle, D.: Gearing Up For Successful Digital Transformation. *MISQE*, vol. 18, 209–220 (2019). doi: 10.17705/2msqe.00017
5. March, J.G.: Exploration and Exploitation in Organizational Learning. *Organization Science*, vol. 2, 71–87 (1991). doi: 10.1287/orsc.2.1.71
6. Stray, V.G., Lindsjorn, Y., Sjoberg, D.I.: Obstacles to Efficient Daily Meetings in Agile Development Projects: A Case Study. In: Bella, G. (ed.) 2013 Third Workshop on Socio-Technical Aspects in Security and Trust (STAST 2013). New Orleans, Louisiana, USA, 29 June 2013 ; [co-located with 26th IEEE Computer Security Foundations Symposium (CSF), pp. 95–102. IEEE, Piscataway, NJ (2013). doi: 10.1109/ESEM.2013.30
7. Prange, C., Pinho, J.C.: How personal and organizational drivers impact on SME international performance: The mediating role of organizational innovation. *International Business Review*, vol. 26, 1114–1123 (2017). doi: 10.1016/j.ibusrev.2017.04.004
8. Fitzgerald, M., Kruschwitz, N., Bonnet, D., Welch, M.: Embracing digital technology: A new strategic imperative. *MIT Sloan Management Review*, vol. 55 (2014)
9. Maedche, A., Legner, C., Benlian, A., Berger, B., Gimpel, H., Hess, T., Hinz, O., Morana, S., Söllner, M.: AI-Based Digital Assistants. Opportunities, Threats, and Research Perspectives. *Business & Information Systems Engineering*, vol. , 535–544 (2019)
10. Morana, S., Pfeiffer, J., Adam, M.T.P.: User Assistance for Intelligent Systems. *Business & Information Systems Engineering*, vol. 62, 189–192 (2020). doi: 10.1007/s12599-020-00640-5
11. Gnewuch, U., Morana, S., Maedche, A.: Towards Designing Cooperative and Social Conversational Agents for Customer Service. *Proceedings of the International Conference on Information Systems (ICIS) 2017*, vol. (2017)
12. Roemmele, M., Gordon, A.S.: Creative Help: A Story Writing Assistant. In: Schoenau-Fog, H., Bruni, L.E., Louchart, S., Baceviciute, S. (eds.) *Interactive storytelling. 8th International Conference on Interactive Digital Storytelling, ICIDS 2015, Copenhagen, Denmark, November 30 - December 4, 2015 : proceedings. Lecture Notes in Computer Science*, vol. 9445, pp. 81–92. Springer, Cham, Heidelberg, New York, Dordrecht, London (2015). doi: 10.1007/978-3-319-27036-4_8
13. Karkh, E.D., Samsonovich, A.V.: Designing a Creative Assistant of a Designer. *Procedia Computer Science*, vol. 123, 212–220 (2018). doi: 10.1016/j.procs.2018.01.033
14. Knote, R., Janson, A., Soellner, M., Leimeister, J.M.: Value Co-Creation in Smart Services: A Functional Affordances Perspective on Smart Personal Assistants. *Journal of the Association for Information Systems (JAIS)*, vol. 22 (2021)
15. Burton-Jones, A., Grange, C.: From Use to Effective Use. A Representation Theory Perspective. *Information Systems Research*, vol. 24, 632–658 (2013)

16. Wagner, K., Nimmermann, F., Schramm-Klein, H.: Is It Human? The Role of Anthropomorphism as a Driver for the Successful Acceptance of Digital Voice Assistants. In: Bui, T. (ed.) Proceedings of the 52nd Hawaii International Conference on System Sciences. Proceedings of the Annual Hawaii International Conference on System Sciences. Hawaii International Conference on System Sciences (2019). doi: 10.24251/HICSS.2019.169
17. Diaz-Bone, R.: Valuation an den Grenzen von Datenwelten Digitale Bewertungspraktiken, pp. 71–95. Springer VS, Wiesbaden (2019). doi: 10.1007/978-3-658-21165-3_4
18. Boltanski, L., Thévenot, L.: On justification. Economies of worth. Princeton University Press, Princeton (2006)
19. Caspin-Wagner, K., Ellis, S., Tishler, A.: Balancing Exploration and Exploitation for Firm's Superior Performance: The Role of the Environment. Proceedings, vol. , 17177 (2012). doi: 10.5465/AMBPP.2012.17177abstract
20. Phene, A., Tallman, S., Almeida, P.: When Do Acquisitions Facilitate Technological Exploration and Exploitation? Journal of Management, vol. 38, 753–783 (2012). doi: 10.1177/0149206310369939
21. Tempelaar, M.P., van de Vrande, V.: Dynamism, Munificence, Internal and External Exploration-Exploitation and Their Performance Effects. Academy of Management Proceedings, vol. , 16656 (2012). doi: 10.5465/AMBPP.2012.16656abstract
22. Gibson, C.B., Birkinshaw, J.: The Antecedents, Consequences, and Mediating Role of Organizational Ambidexterity. Academy of Management Journal, vol. 47, 209–226 (2004). doi: 10.5465/20159573
23. Dellermann, D., Ebel, P., Söllner, M., Leimeister, J.M.: Hybrid Intelligence. Bus Inf Syst Eng, vol. 61, 637–643 (2019). doi: 10.1007/s12599-019-00595-2
24. Kang, Y.L., Nah, F., Tan, A.H.: Investigating intelligent agents in a 3D virtual world. Proceedings of the International Conference on Information Systems (ICIS) 2012, vol. (2012)
25. Ryan, J., Snyder, C.: Intelligent Agents and Information Resource Management. Proceedings of the Americas Conference on Information Systems (AMCIS) 2004, vol. (2004)
26. Winkler, R., Bittner, E., Soellner, M.: Alexa, Can You Help Me Solve That Problem? – Understanding the Value of Smart Personal Assistants as Tutors for Complex Problem Tasks. Proceedings of the Internationale Tagung Wirtschaftsinformatik 2019, vol. (2019)
27. Siddike, M.A.K., Spohrer, J., Demirkan, H., Kohda, Y.: People's Interactions with Cognitive Assistants for Enhanced Performances. In: Bui, T. (ed.) Proceedings of the 51st Hawaii International Conference on System Sciences. Proceedings of the Annual Hawaii International Conference on System Sciences. Hawaii International Conference on System Sciences (2018). doi: 10.24251/HICSS.2018.205
28. Biundo, S., Höller, D., Schattenberg, B., Bercher, P.: Companion-Technology: An Overview. KI - Künstliche Intelligenz, vol. 30, 11–20 (2016). doi: 10.1007/s13218-015-0419-3
29. Diederich, S., Brendel, A.B., Kolbe, L.M.: On Conversational Agents in Information Systems Research. Analyzing the Past to Guide Future Work. Proceedings of the Internationale Tagung Wirtschaftsinformatik 2019, vol. (2019)

30. Seeger, A.-M., Pfeiffer, J., Heinzl, A.: Designing anthropomorphic conversational agents. Development and empirical evaluation of a design framework. Proceedings of the International Conference on Information Systems (ICIS) 2018, vol. (2018)
31. Feine, J., Morana, S., Maedche, A.: Designing a Chatbot Social Cue Configuration System. Proceedings of the International Conference on Information Systems (ICIS) 2019, vol. (2019)
32. Meisel, W.: Building Digital Assistants and Bots. A Vendor Guide and Market Analysis (2016)
33. Austin, T., Brant, K.: Gartner Hype Cycle for Smart Machines (2016)
34. Choi, C.J., Kim, J., Eldomyaty, T.: The role of social conventions in the diffusion of open source software: Implications for service industries. *The Service Industries Journal*, vol. 25, 789–801 (2005). doi: 10.1080/02642060500103365
35. Hurni, T., Huber, T., Dibbern, J.: Coordinating platform-based multi-sourcing: introducing the theory of conventions. Proceedings of the International Conference on Information Systems (ICIS) 2015, vol. (2015)
36. Sharon, T.: When digital health meets digital capitalism, how many common goods are at stake? *Big Data & Society*, vol. 5 (2018). doi: 10.1177/2053951718819032
37. Boltanski, L., Chiapello, E.: The New Spirit of Capitalism. *International Journal of Politics, Culture, and Society*, vol. 18, 161–188 (2005). doi: 10.1007/s10767-006-9006-9
38. Lafaye, C., Thévenot, L.: Une justification écologique?: Conflits dans l'aménagement de la nature. *Revue Française de Sociologie*, vol. 34, 495 (1993). doi: 10.2307/3321928
39. Diaz-Bone, R.: Economics of Convention and its Perspective on Knowledge and Institutions. Springer, Cham (2018)
40. Thévenot, L.: Organized Complexity. *European Journal of Social Theory*, vol. 4, 405–425 (2001). doi: 10.1177/13684310122225235
41. Diaz-Bone, R., Horvath, K.: Official statistics, big data and civil society. Introducing the approach of “economics of convention” for understanding the rise of new data worlds and their implications. *Statistical Journal of the IAOS*, vol. 37, 219–228 (2021). doi: 10.3233/SJI-200733
42. Da Silva, N.: L'industrialisation de la médecine libérale : une approche par l'Économie des conventions. *Management Avenir Sante*, vol. N° 3, 13–30 (2018)
43. Rabiee, F.: Focus-group interview and data analysis. *The Proceedings of the Nutrition Society*, vol. 63, 655–660 (2004). doi: 10.1079/pns2004399
44. Myers, M.D., Newman, M.: The qualitative interview in IS research: Examining the craft. *Information and Organization*, vol. 17, 2–26 (2007). doi: 10.1016/j.infoandorg.2006.11.001
45. Wolf, C., Joye, D., Smith, T.E.C., Fu, Y. (eds.): *The SAGE handbook of survey methodology*, vol. . SAGE reference, London, Thousand Oaks, new Delhi, Singapore (2016). doi: 10.4135/9781473957893
46. Bhattacharjee, A.: Social science research. Principles, methods, and practices. Anol Bhattacharjee; Open Textbook Library; Scholar Commons, University of South Florida, [Tampa, Florida], Minneapolis, Tampa (2012)
47. Korteling, J.E.H., van de Boer-Visschedijk, G.C., Blankendaal, R.A.M., Boonekamp, R.C., Eikelboom, A.R.: Human- versus Artificial Intelligence. *Frontiers in artificial intelligence*, vol. 4, 622364 (2021). doi: 10.3389/frai.2021.622364

48. Madaio, M.A., Stark, L., Wortman Vaughan, J., Wallach, H.: Co-Designing Checklists to Understand Organizational Challenges and Opportunities around Fairness in AI. In: Bernhaupt, R. (ed.) Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems. ACM Digital Library, pp. 1–14. Association for Computing Machinery, New York,NY,United States (2020). doi: 10.1145/3313831.3376445
49. Seering, J., Luria, M., Kaufman, G., Hammer, J.: Beyond Dyadic Interactions. In: Brewster, S. (ed.) Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. ACM Digital Library, pp. 1–13. Association for Computing Machinery, New York,NY,United States (2019). doi: 10.1145/3290605.3300680