

SHARE: An Interactive Learning System for Improving Legal Consultation Services and Training

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Abstract—Providing citizens with transparent, efficient, and consistent legal advice is a critical challenge to uphold governmental fairness in societies. However, this remains a tall order for already overburdened organizations. This paper proposes an interactive learning system that seeks to address these challenges through an organizational learning lens, in collaboration with the Legal Desk in the Netherlands. This system, called SHARE, serves the dual purpose of supporting legal consultations and enhancing the training of legal advisors. SHARE captures and stores strategic decision-making knowledge from experienced legal advisors and facilitates its transfer to less experienced advisors. We explain in this case study the system’s approach, prototype design, and evaluation through exploratory user tests. Our findings suggest that this prototype has the potential to contribute towards improved knowledge management for conducting legal consultations within the Legal Desk. To conclude, we discuss the outlook and broader implications of this approach in knowledge-driven work environments.

I. INTRODUCTION

Today’s citizens expect government services to be more transparent, accessible, and responsive, and these expectations continue to rise. While there has been many efforts to improve service delivery, they often struggle to fully meet the public’s growing demands. Despite advancements such as self-service online portals and more recent solutions like large language model-based chatbot government services [1], uptake remains limited. The success of digitization and automation often hinges on factors like capacity, location, country, cultural practices, and situational contexts. As a result, in-person and telephone channels still dominate most citizen interactions with their government [2]. This makes staff members, who can deliver professional, clear, consistent, and courteous services, crucial to citizen satisfaction. Such direct service places staff at the forefront of fostering a citizen-oriented approach, emphasizing the importance of their training and education. In this work, we present a case focused on enhancing legal knowledge exchange and training for legal advisors in the delivery of legal consultation services, in collaboration with the Legal Desk in the Netherlands.

Learning from experience is a cornerstone of legal education and training [3]. Drawing on past experiences helps inform

future practice decisions, a form of learning that is essential in fields such as medicine, law, education, and business, where hands-on experience is critical for developing professional competencies. However, this form of competence requires on-the-job learning that takes years. At the Legal Desk, it takes new hires at least 1.5 years to become experienced advisors. This training time is essential but time-consuming for the Legal Desk that is overworked. Compared to 2022, 2023 saw a 24% increase in in-person counter visits (from 57,900 to 71,700) and 148% increase in consultation appointments (from 15,500 to 38,500) [4]. However, the number of legal advisors increased by 2 (from 256 to 258), and the number of more experienced legal advisors increased by 1 (from 31 to 32). The workload of the legal advisors has significantly increased with the rising demand and limited growth in personnel.

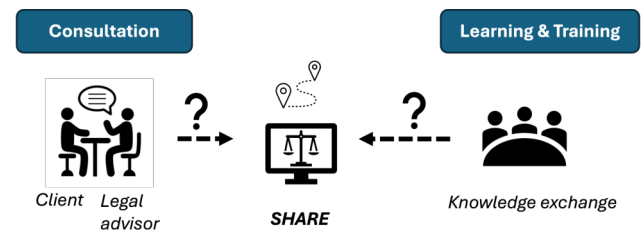


Fig. 1. SHARE aims to establish a knowledge connection between consultation and learning sessions within the existing workflow.

Our contribution is a novel interactive learning system called SHARE designed to improve legal consultation services and training of the legal advisors (see Figure 1). Our approach focuses on aligning structured and strategic knowledge elicitation, transfer, and management, while ensuring compatibility with existing organizational practices for ease of adoption.

We present this system as a solution to a highly complex and “wicked” problem [5], that is enhancing organizational learning to create more citizen-oriented legal services. Within the organization, there are many task and information interdependencies that are challenging to navigate and hence there is an intrinsic resistance for the solution. To this end,

we emphasize an open-ended, design-thinking approach from shaping the problem statement to co-creating solutions.

The SHARE system consists of physical tabletop components to support interaction and collaborative learning, next to a digital component (i.e., a web application) to capture and store structured legal information and the advisors' ways of working. This paper aims to explain a case study for the co-creation process, implementation, and the preliminary evaluation of this interactive learning system.

II. RELATED WORK

A. Knowledge management system

Organizations rely on systematic approaches to retain knowledge. Despite of theoretical frameworks in organizational learning (e.g., single-loop, double-loop learning concepts [6], [7], organizational knowledge creation theory [8], and the five building blocks theory [9]), these approaches lack practical guidance and prescriptions and practitioners also match practical approaches to theory. A notable approach is Communities of Practice (CoP), which focuses on providing an informal learning environment where novices and experienced members of the community interact with each other [10], [11]. Through these interactions, CoP act as a forum for members to learn from each other and past experiences and to trigger joint systematic problem solving. CoP can also be formed by members outside of the organizational borders to help and enable learning within the organization (i.e., the scenario in this case study) [12].

Knowledge management is closely linked to organizational learning. It involves harvesting information and converting it into stored knowledge while ensuring that the knowledge is accurate and up-to-date. It may result in concrete and tangible outputs from the learning process, and facilitates in fortifying organizational memory. Organizational learning is a means to achieve continuous knowledge creation, retention, and utilization. Our physical and digital prototype solution which focuses on the knowledge elicitation, representation, retention, and the transfer process itself is situated at the intersection of complementary knowledge management and organization learning disciplines.

B. Legal learning and education

Legal education has traditionally relied on case-based methods, lectures, and moot court exercises to teach students legal reasoning and professional skills [13], [14]. A number of modern approaches focusing on experiential learning and gamification and interactive platforms have been proposed for legal education. Experiential learning leverages clinical programs (e.g., shadowing) and simulations, that aims to bridge the gap between theory and practice [15]. Gamification platforms also provide different scenarios for the legal learners to explore, providing a risk-free environment for practicing decision-making and experimentation [16].

Our proposed system shares some of the design goals as previous approaches (i.e., interactive and collaborative platform to access legal content [17]). However, our system is

oriented towards legal advisors specifically via co-creation approaches so that we maximize likelihood of adoption of this new learning tool. We provide both low-tech (i.e., paper) and digitally innovative form-factors to create a more flexible learning framework.

C. Participatory design

Participatory approaches give substantive agency to stakeholders in product design and development. These approaches follow various traditions drawn from multiple disciplines, such as technology design, policy-making, and social sciences [18]. Belonging to the general approach in user-centered design, participatory design aims to incorporate a diverse range of perspectives, including for non-experts [19], [20]. It encourages continuous exploration and monitoring of the power dynamics between multiple stakeholders [21], [22]. Co-design is a type of participatory design that aims to foster user ownership by actively involving the stakeholders to contribute to the design solutions [23], [24]. The collaborations are more active and sustained, emphasizing on more equal partnerships and shared decision-making.

III. APPROACH

Our research methodology is principally based on practice-led research where the production, application, and evaluation of creative work leads the process of research [25]. Based on action research strategies that systematically generate and validate new information, procedures, and understandings thereof through practice [26], we emphasize on problem discovery and solving. In this section, we describe the objectives and the co-creation process leading to the design and implementation of the interactive learning system.

A. Conception and rationale

The main interdependent objectives of the SHARE interactive learning system are: (1) Ensuring consistency & quality in customized legal advice; (2) Improving knowledge retention & transfer within the Legal Desk; (3) Finding strategic and possible routes/solutions to cases; (4) Contributing to a citizen-oriented government.

Achieving consistency in customized legal advice (Objective 1) relies on effectively addressing the challenge of improving knowledge retention and transfer within the Legal Desk (Objective 2). Similarly, jointly exploring alternative strategic routes to appropriate advice in cases and problem-solving approaches (Objective 3) can only have a meaningful impact if Objectives 1 and 2 are also met. By addressing Objectives 1 through 3, the project makes a step towards fostering a citizen-oriented government (Objective 4). Citizens could be helped by an organization with streamlined learning and service delivery process. In this context, finding answers to our research questions (RQ) leads to meeting Objectives 1, 2 and 3. While ensuring and measuring consistency in custom legal advice depends on actively using the SHARE system, Objectives 2 and 3 form the foundation for developing the SHARE interactive learning system.

B. Co-creation process

The process started with observation sessions with three legal advisors at the counter and subsequently observing four consultation hours with clients. These exploratory observation sessions helped the core team to understand the workflow of the Legal Desk, the complexity of the cases, and expertise required to handle the cases.

Over a period of 12-months (May 2023-June 2024), the core team conducted a series of co-creations, design sessions, one-on-one appointments, and evaluation sessions with the Legal Desk advisors at the immigration law department. The first three sessions were scoping and brainstorming sessions. Over this period, we co-created various diagrams, mind maps, schematics, and sketches as a necessary endeavor to envision and materialize the SHARE prototype. Preliminary depictions were milestones of progress toward fulfilling the intended problem discovery and definition.

1) *Shape Language*: Along with post-its, pens, and papers for brainstorming, we also used the Shape Language¹ to support communication between the participants. Shape Language is designed as an intuitive communication instrument to address complex problems. It consists of 3D geometric shapes inspired by architecture (e.g., pyramids, spheres, cube, etc.). These geometric shapes are manipulated without instructions and free of predefined meaning to facilitate the abstraction of complex problems through a joint sense-making process. It has been shown that geometric shapes are related to emotions, metaphoric clues, and are associated with affective value that may assist in interaction and learning [27], [28]. The Shape Language was augmented with a 2D chip variant including triangles, circles, squares, bars/sticks, upon suggestions during the co-creations. They are incorporated in our proposed learning system to provide some tactile interactions that could support learning [29] (see Figure 2).

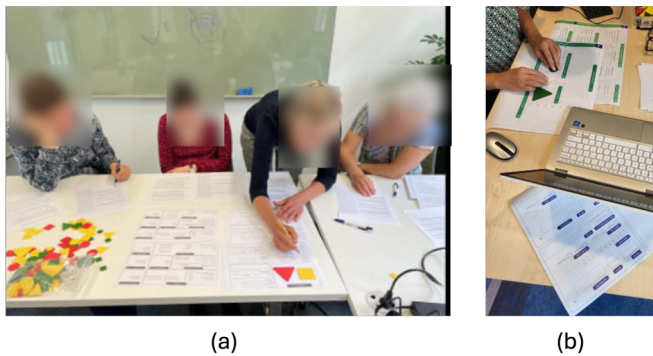


Fig. 2. Shape Language in use during co-creation (a) and client test (b).

2) *Transitioning into solution-building*: The initial co-creation sessions were exploratory. Topics ranged from introducing the use of the Shape Language, identifying regularly occurring complex types of client situations (we here call these canonical situations) and design challenges. In line with the

design thinking approach of continuous solution-finding [30], we had different goals per co-creation session, while maintaining an overarching approach to create a divergent thinking mindset, before eventually moving into solution design. The co-creation sessions were insightful to share knowledge and experiences, followed by the participants thinking *together* about feasible solutions to perceived obstacles and organically arriving at the desire to implement those solutions.

In December 2024, the team converged on the concept of using *canvases* as a type of laying field for case problem-solving. The idea is that these canvases physically represents the core topics, questions and answers essential for strategic information gathering on canonical situations and are designed to support conversations with clients. As canvases capture the diagnostic strategic knowledge of experienced legal advisors, jointly preparing the canvas content results in knowledge exchange with less experienced colleagues.

3) *Elucidating strategic decision-making*: We further define what the structure of strategic decision-making is in the context of using the canvases. The procedure starts with a so-called working thought and ends with an associated advice. The process resembles hypothetical reasoning. Based on an initial assessment of the situation and the desire or expectation to be able to provide specific advice to the client, the advisor forms a working thought (hypothesis). This working thought will be tested by asking targeted relevant questions searching for the key information. The key information they look for is two-fold: essential information that should always be satisfied for giving that advice, and also checking contradictions, i.e., information that invalidates the working thought and advice strategy. Depending on the answers and the evidence obtained, the associated advice is tailored to the client situation, or the working thought is reformulated and the process repeated until an advice is given. This procedure helps advisors to quickly capture the essential information about a case by choosing a route across the canvas(es). As the canvas contains the strategic knowledge of the more experienced advisors, it unlocks this knowledge for the less experienced advisors by following the same working thought and route for problem-solving.

4) *Canvas co-design*: Being able to formulate the above-mentioned working thoughts and questions to seek key information is essential for the success of the canvas approach. As a first approach we worked with a collection of questionnaires via Google forms to identify the key information and the most relevant questions asked by the advisors to obtain the essential answers from the client, drawing on their experience gathered from canonical case scenarios². We asked the advisors to create a list of topics or the so-called knowledge card. For each knowledge card, we asked for the underlying reason why the knowledge card belongs to a canvas (with the assumption that there are some topics that are common between the canonical cases). We then asked the advisors to formulate several example questions for each knowledge card that the advisor

²The elicited working thoughts and questions are not client-specific but based on canonical case scenarios. No personally identifiable information were included.

¹See VormTaal: <https://www.vormtaal.com/>

should ask or consider to obtain the key information. This process was intuitive, as the experienced advisor, after some initial questions, completed the Google form questionnaires for some of the earlier identified canonical situations, i.e., a specific *legal framework* (i.e., the combination of a legal topic {family migration, integration, end of relation} with a geographical region pertaining to the legal case in question {NL, EU, 3rd countries}).

In the following co-creation design session, the advisors placed the collected knowledge cards per canonical situation on a canvas. They exchanged knowledge and together arrived at the order of the questions and knowledge on the canvas or adjusted where necessary. Here, working thoughts resemble the concept of hypothesis based on the given facts from the situation and serves as the starting point of further investigation using the questions on the knowledge cards. The participants decided to create a so-called “situation canvas” to support the collection of information that is key to any case in legal field of immigration law. With this approach, the ideation of the prototype, i.e., the use of canvases to capture strategic decision-making to facilitate advice-giving during consultation, is finalized. While the physical versions of the canvases (i.e., paper versions) were straightforward and intuitive to implement given the defined workflow, we also agreed on a scalable and flexible implementation. This motivated a web application for building and interacting with the canvases to easily store and access canvas-derived information.

IV. THE SHARE PROTOTYPE

The prototype consists of a *physical canvas* (in paper form) and a *digital canvas* (in web application form). The deliberate choice for having both is that each enhances different modes of communication. We chose to design both forms of the canvas, which showed to be of added value during the client test sessions (see Sec. VI-E) as advisors and clients have different preference. The differing properties of the physical and digital versions of the canvas system are related to explainability and accessibility of information and discussed in this section.

A. Situation canvas

The situation canvas provides the first impression of the key case details for physical paper and digital web version, respectively (see Fig. 3). In the situation sketch box, the Legal Desk advisors can use the 2D Shape Language chips (see Sec. III-B1) to visually represent the case situation. The situation information depicts the people involved and their relation to the client. For the physical version, these chips are available in different colors (red, yellow, green). In contrast, the web version supports “drag and drop” operation of the shapes, which we will extend in future work to include different colors and more flexible drawing options. After sketching the situation, the system provides a notes block to record additional key information on all the people involved in the client’s case, their age, nationality, residence history, and dependency status. The web application version mirrors the paper version. Leveraging the situation sketch and the basic information gathered about

the legal case, the advisors make an informed decision on the legal framework that is most relevant to the case (e.g., integration for 3rd country individuals).

B. Knowledge cards and conversation canvas

Each knowledge card includes a collection of questions related to a topic relevant to the chosen legal framework. Answer types ({free text, single choice, multiple choices}) are coupled to each question. Each knowledge card has two explanation fields for: (i) a generic explanation/information of how and why this knowledge card is important to *all* legal frameworks, and (ii) a canvas-specific explanation that contains information of why this knowledge card is important to the *particular* canvas. For example, suppose the users decide to create a knowledge card for “nationality”. Explanation type (i) contains generic information such as a list of countries in EU, EEA, and Schengen area, which are facts regardless of the legal framework. Explanation type (ii) may contain information about Suriname, a former colony of the Netherlands. This information would be relevant to “Integration”, compared to other legal frameworks, as the integration requirements could be different for individual of Surinamese nationality. Fig. 4 shows the paper and web version of the knowledge cards on a conversation canvas.

While the physical paper version and the digital web application are designed to present the same information, there are few key differences that emphasize the strengths of paper and digital versions respectively. First, the aforementioned explanation fields are available in the digital version as we store the information in a database. This is impractical to replicate for the paper canvas version because of the number of documents and the amount of both structured and unstructured information associated with each topic. Secondly, the paper canvas has a limited footprint (i.e., only a handful of questions would fit on paper). This is a deliberate design choice that encourages the advisors to choose the *most* relevant content on topical- and answer-level. The paper canvas limits the possibility of getting sidetracked by case-specific details, which would be of particular added value when dealing with complex scenarios while finding a strategic solution. The web application, however, is designed to be flexible and store unstructured information into structured templates. To strike a balance between generality and specificity, the web application enables the users to select which knowledge cards, questions, and answers should be shown on a specific canvas. The principle of putting information that is necessary and sufficient to cover the canonical scenarios when building canvases was explicitly communicated to the users.

C. Advice cards

Advice cards are unique features of the web application (see Fig. 5). Each advice card contains the advice name, supporting information to the advice, an explanation of the advice at Common European Framework Level - B1 Dutch language level (i.e., at a common every-day Dutch level rather than using legal jargon), and an action list pertaining to the advice.

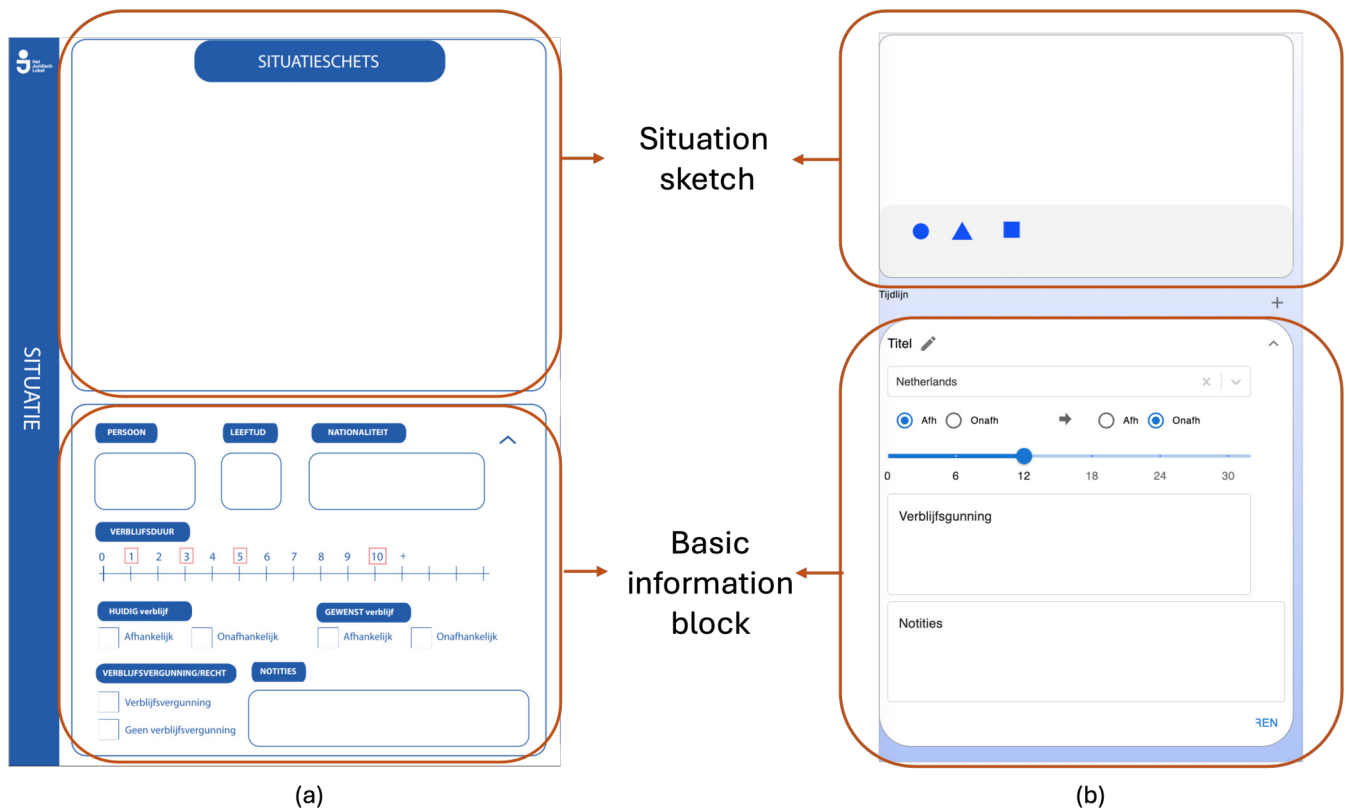


Fig. 3. Situation canvas in (a) paper and (b) web application (in Dutch, with labeled legends).

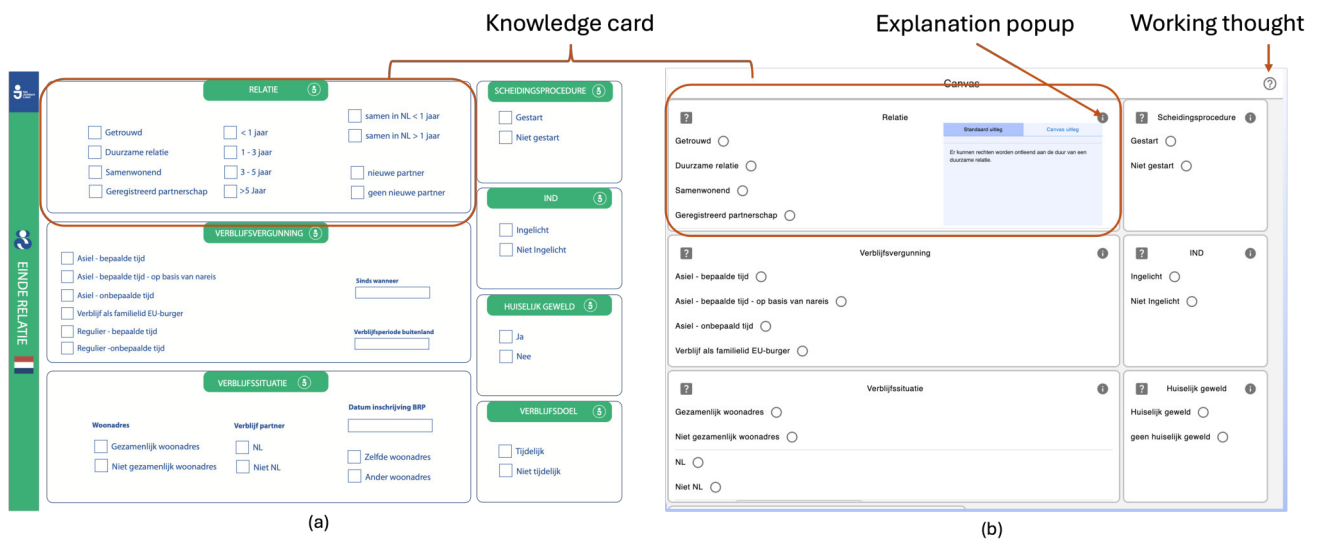


Fig. 4. Conversation canvas in (a) paper and (b) web application (in Dutch, with labeled legends).

Coupled advice → Gekoppeld advies

Legal advice and reference → Vrijstelling Basisexamen - basisexamen

B1 explanation → B1 uitleg: Ons advies is om vrijstelling voor het Basisexamen aan te vragen. Dit mag namelijk als u de Surinaamse nationaliteit hebt en minimaal lager onderwijs in het Nederlands hebt afgerond in Suriname of Nederland. Voor de aanvraag moet u een aantal acties doen. Als eerst moet u het formulier Basisexamen inburgering buitenland 7106 ophalen via dit webadres: <https://ind.nl/nl/formulieren/7106.pdf>, invullen en uitprinten. Ten tweede hebt u een gewone of gewaarmerkte kopie van uw diplomas of certificaten nodig. Op een gewaarmerkte kopie staat een datum, handtekening en stempel. Met een gewaarmerkte kopie verklaart een instantie dat de inhoud van de kopie gelijk is aan het origineel. Stuur nooit het origineel op. Stuur de bijlage en bewijzen mee met de aanvraagformulier met de kopie van uw diplomas of certificaten op. De te volgen stappen zijn hieronder voor u kort samengevat. Als u later nog vragen hebt, kunt u weer contact met ons opnemen.

Action list →

Acties			
Vul het basisexamen inburgering buitenla	☐	☐	☐
Stuur de bijlage en bewijzen mee met de	☐	☐	☐
Stuur een gewone of gewaarmerkte kopie	☐	☐	☐

Fig. 5. Example of an advice with the actions list (in Dutch, with labeled legends).

Concretely, the action list should contain tasks to complete, for example, bringing proof of marriage certificate. Advice cards can be associated to the answer combinations on the canvas. When the desired advice cards are picked for the canvas during a conversation, the advisor can indicate the status of the actions in the action list, where “red” means the action cannot be completed, “orange” as action in progress, and “green” as action completed. This way, both the advisors and clients, and also the subsequent advisors taking over this case have a clear overview of the status of the case. The B1 Dutch explanation and the action list are automatically generated into a PDF document available for printing.

D. Automated advice suggestion

The conversation canvas is stored after creation and becomes non-editable during use (i.e., during consultation hours). The conversation canvas now contains strategic questions that need to be answered before giving advice to clients (the need depends on the strategic path of posing questions chosen by the advisor). Based on the single-choice and multiple-choice answers (excluding free text responses for this iteration), the web application automatically suggests predefined or previously given advices for which the answer choices match. This is achieved by storing the answer combinations along with the advice when the conversation canvas is saved. As the user selects the same answer combination in a new conversation canvas, the application back-end runs the match check. The matched advice is shown at the bottom of the conversation canvas. Advisors can review all matched advices and select applicable ones. After selection, the advices are modifiable for the specific instance without changing the original advices serving as more general templates.

V. USE CASE

A. Give advice with the use of the canvas

In the current way of working at the Legal Desk, advisors take legal consultation hours (approximately 60-minute sessions for immigration law) with clients after intake at the desk.

The consultation hours are oriented towards problem-solving for the client case. Case details are registered in Webtop in the form of text. Advice to the client can be emailed to clients.

The consultation process largely relies on strategic decision-making based on strong expert knowledge. The SHARE system aims to facilitate this process in improving the working experience of advisors and client engagement during consultation. Through the use of the situation and existing conversation canvases categorized by legal frameworks, the SHARE system enables a more streamlined process of asking questions and gathering evidence. We posit that using the system would benefit less experienced legal advisors in particular as they could rely on previous cases and their advice, and structured references of legal information. We also hypothesize that the SHARE system would be welcomed by clients as they can visualize their situation and work through the conversation canvas with the advisor during consultation. Results from the user test designed for this use case and our findings are presented in Sec. VI-A.

B. Create a canvas with a group

To complement “online” real-time support to advisors during client consultations, the SHARE system also facilitates learning “offline”, especially during collaborative reflection sessions. We envision that advisors would discuss patterns from cases and create new conversation canvases, knowledge cards, and advice cards to suit their needs. Advisors could synthesize structured knowledge, supplemented by legal references, and store them in the web application.

Knowledge management and efficient knowledge transfer are critical for retaining institutional knowledge (to mitigate knowledge erosion), promote innovation (inspired by group discussions), and ensure continuity (to minimize the impact of employees turnover and retirement). Crossan et al. take these distinct stages together in the four pillars of a learning organization: intuition, interpretation, integration and institutionalization [31]. The SHARE system not only supports documenting explicit knowledge (e.g., links to documents, websites, etc.) but also captures tacit knowledge by enabling advisors to document each consultation in a structured way.

We believe that such a system would promote Communities-of-Practice in introducing a way of working that anchors group learning. By collaboratively reflecting on representative and challenging cases using the SHARE system, advisors can actively engage with one another. This interaction encourages joint brainstorming of creative solutions, benefiting both experienced and less experienced advisors. While experienced advisors contribute their insights, less experienced advisors gain valuable knowledge to better prepare for consultation hours. Results from the user test designed for this use case and our findings are presented in Sec. VI-B.

VI. EVALUATION

To evaluate the SHARE system prototype, we have conducted a series of usability tests focusing on the aforementioned two use cases. The usability tests aimed to assess the

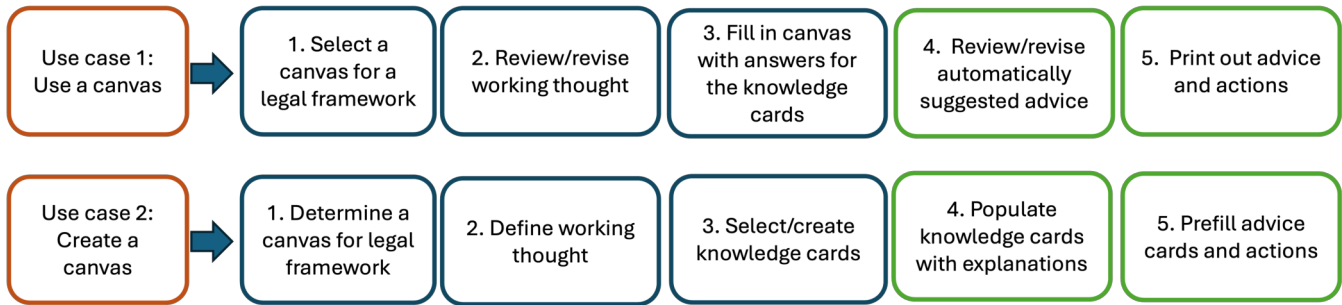


Fig. 6. Workflow of the two use cases of SHARE. Green-outlined boxes show the functionality that is only available in the web application, not on paper. Note that a canvas needs to be created before it can be used. SHARE provides a growing number of starter template canvases.

perceived usefulness and ease of use of the system. Post-task questionnaire evaluations were collected, with questions based on the questionnaire from [32]. The questionnaire is on the 7-point Likert scale, where 1 represents “extremely unlikely”, 7 represents “extremely likely”, and 4 represents “neutral” (see list of questions in Table I). Verbal feedback was recorded as notes by research members. Two additional observation sessions and a client test session were conducted, which provide triangulation to validate our findings and gain a more comprehensive understanding. While these pilot tests are preliminary due to a lean development process, they provide positive indicators for deployment of the system in the organization after the pilot and shed light on some limitations and future work.

A. User test: giving advice

This study focuses on using the SHARE system to advising clients. The experiment was conducted in two sessions at the Legal Desk headquarter office. The first session was attended by three more experienced legal advisors and the second session was attended by one experienced advisor, one strategic development manager, and four less experienced legal advisors. The categorization of experience level is made based on a combination of years of experience, self-assessment, and perception from the strategic development contact involved with the research team. The experimental setting is a low-fidelity role-play simulation. The participants were divided into groups of two with a member of the research team joining the experiment as a facilitator and primarily acted as the client seeking legal help.

In both sessions, the groups were presented with four example legal cases from the legal domain of integration and immigration law. These four cases are fictional but have been reviewed by an experienced advisor prior to the session to ensure that they are representative of actual cases. They were first asked to experience the paper print-out copy of the conversation canvas for the role-play consultation of one case. During this experiment the advisors filled out the situation sketch (i.e., basic information about the case and clients) and the interactive canvas (i.e., the canvas containing the strategic

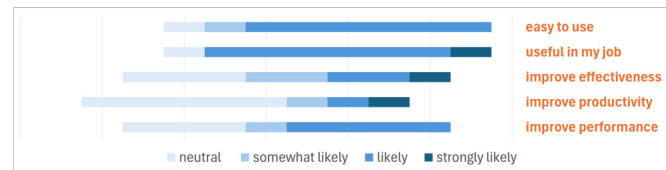


Fig. 7. Overview of ratings distribution of the web application for giving advice.

questions and their answer choices). Subsequently, they filled out a post-task questionnaire about this task ³.

A tutorial walk-through of the web application was shown to the experiment participants before they started the experiment. The tutorial demonstrates basic operations in the application while working with an example case. It was played once at the beginning at the session. The participants then completed the tasks of working through four legal cases on their own work laptop. Advisors in the same group alternated the control of the application between cases. After completing the cases, the advisors were asked to fill the post-task questionnaire. The results are shown in Fig. 7 for the ratings distribution related to ease of use and long-term effect for job performance. The session concluded with a round-table discussion and feedback.

The results indicate a positive impression for perceived usefulness and ease of use. Despite the SHARE system being a proof-of-concept, the results show that there is potential to improve effective, productivity, and performance upon adoption and system iteration when giving advice to clients. In the context of this user test, results from the post-task questionnaire and after-scenario test from the paper and web version are comparable. Sample size of this comparison is small with three users that participated in evaluation of both versions. Therefore, our assessment remains qualitative. One user gave the feedback that “except of some points in the document (referring to the paper canvas), it is easy to fill in”, and that “at first it take some getting used to [do the task]”.

³This evaluation of the physical version was only conducted in the second session with the less experienced advisors, as the more experienced advisors were already familiar with the physical canvases from previous co-creation sessions.

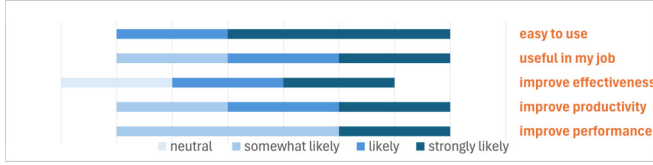


Fig. 8. Overview of ratings distribution of the web application for creating a new canvas.

B. User test: create a new canvas

This study aims to explore the usability of the SHARE system for creating a new *digital* interactive canvas, also as a means of learning and knowledge transfer between legal advisors. This study consists of one session attended by two more experienced and one less experienced legal advisors ($N = 3$). In this session, the advisors worked through a series of tasks in the web application, with increasing complexity⁴. A video tutorial of this creation process was shared with the advisors before the test session. Note that the tasks in the exercise were different from the ones shown in the tutorial video. The tasks mainly covered the following topics: (1) edit and create knowledge cards, (2) edit existing canvases, (3) create new canvases, and (4) edit and create advice cards.

We designed these tasks such that upon completion, the users should be able to make adjustments to existing components in the web application and create new content (e.g., a new canvas with complete knowledge cards and advice cards). The results of the post-task questionnaire are shown in Fig. 8 for a subset of the questionnaire questions related to ease of use and long-term effect for job performance. It shows a generally positive indication for perceived usefulness and ease of use in this *Create* mode of the web application.

C. Questionnaire results analysis

In Table I, we report the average of the ratings across subjects and all questions for perceived usefulness and perceived ease of use, for both user tests. After segmenting results from less experienced and experienced legal advisors, we found slightly higher averaged perceived usefulness scores (4.88 out of 7) from less experienced advisors than experienced advisors (4.25 out of 7). This result is in line with the intuition that experienced advisors may not need the SHARE system to facilitate them during advice consultation in the first place, therefore finding it less useful. Note that these opinions from the advisor were formed before learning about the usefulness according to their clients, see Sec. VI-E. We also note that the perceived short-term usefulness is lower than long-term usefulness for both use cases. To supplement these results and demonstrate the extent of inter-rater agreement, we calculate the Krippendorff's alpha values for over all the ratings on both user tests. We found that there is a fair agreement [33] in the advisors' evaluation for both use cases, 0.27 and 0.20,

⁴Here we loosely determine the notion of complexity as the transition between different modules and the number of clicks to achieve the desired results.

respectively. However, we also note the disparity in ratings among the advisors. With these results, we aim to demonstrate the collective perception of the SHARE system among advisors who agreed to our tests, and we emphasize that they are not implicative of generalization capability. These post-task questionnaires are self-reports and, though anonymized, taken in the presence of the research team, which leads to subjectivity and bias of the measure. While the results indicate a positive change with the use of the SHARE system, the lack of a control group and objective limits the ability to determine whether the perceived usefulness and ease of use can be attributed to the system itself.

Due to the small sample size, we supplemented the questionnaire with a round of post-task discussions where the advisors gave verbal feedback. We highlight the comments related to lack of usefulness on a short-term basis (translated from Dutch). These comments corroborate the average ratings that we see in the questionnaire.

"I think that the SHARE web app is now designed with a structure that is flexible. The frame that has been set up is clear and easy to use. But it will take a lot of time in the short term to fill in all the legal information and to ensure that all components are complete. It is a product that will be very useful in the long term, it will still be quite a task to work everything out." - an advisor's feedback after the giving advice user test

"I think this system has an incredible amount of potential. It will take a lot of work to process all the relevant legal information, but the app is user-friendly and offers the possibility to do so." - an advisor's feedback after the creating canvas user test

Even for the use case in giving advice (where the advisors use a fixed template canvas), one advisor points out that there is still much information to be filled in, potentially referring to the need to revise the advice card and action lists. Surprisingly, creating a canvas is perceived to be easier than using a canvas when giving advice, although creating a canvas is of higher complexity than using an existing canvas. It could be because some advisors already had been exposed to the web application during the "giving advice" user test which predates the "creating a canvas" user test (Sec. VI-B). These effects and observations need to be further confirmed with larger sample size in the future.

D. Observation sessions

In addition to our findings from the post-task questionnaires, observations were conducted in two separate accounts with a focus on observing aspects related to organizational learning (i.e., evidence of knowledge sharing within the organization). The first observation session aimed to inform the design of the physical canvas, which occurred before the "Giving Advice" test (see Sec. VI-A) and was attended by two experienced advisors and one less experienced advisor. The participants agreed that the overview and the visual aspects of

TABLE I
PUEU RATINGS FOR “GIVING ADVICE” AND “CREATING A CANVAS” (MIN: 1, EXTREMELY UNLIKELY; MAX: 7, EXTREMELY LIKELY).

	Giving advice ($N = 9$)			Creating a canvas ($N = 3$)		
Perceived usefulness	Avg(Std)	Min	Max	Avg(Std)	Min	Max
Using the system in my job would enable me to accomplish tasks more quickly	4.6(1.4)	2	6	5.3(0.6)	5	6
Using the system would improve my job performance (short-term)	3.7(1.5)	2	6	4.7(1.5)	3	6
Using the system would improve my job performance (long-term)	5.2(1.0)	4	6	5.7(1.1)	5	7
Using the system in my job would increase my productivity(short-term)	3.3(1.1)	2	5	4.7(1.5)	3	6
Using the system in my job would increase my productivity (long-term)	4.9(1.2)	4	7	6.0(1.0)	5	7
Using the system would enhance my effectiveness on the job (short-term)	3.8(1.5)	2	6	4.3(1.5)	3	6
Using the system would enhance my effectiveness on the job (long-term)	5.2(1.1)	4	7	5.7(1.5)	4	7
Using the system would make it easier to do my job	5.2(0.8)	4	6	5.3(1.2)	4	6
I would find the system useful in my job	5.9(0.8)	4	7	6.0(1.0)	5	7
Perceived ease of use						
Learning to operate the system would be easy for me	5.8(1.0)	4	7	6.7(0.6)	6	7
I would find it easy to get the system to do what I want it to do	5.4(0.9)	4	7	6.7(0.6)	6	7
My interaction with the system would be clear and understandable	4.9(0.6)	4	6	6.3(0.6)	6	7
I would find the system to be flexible to interact with	4.8(0.8)	4	6	6.0(1.0)	5	7
It would be easy for me to become skillful at using the system	5.8(1.0)	4	7	6.7(0.6)	6	7
I would find the system easy to use	5.6(0.7)	4	6	6.7(0.6)	6	7

the physical canvas and the knowledge cards would be most helpful during collaborative reflection and client consultation hours. It also offers support to see the difference between exceptions or business-as-usual cases. The less experienced advisor especially appreciated the structure and the guidance of the canvas and the cards. The more experienced advisors specifically refer to the Shape Language and the value of using these in explaining complex issues. It was observable that the participants are slightly pushed out of their comfort zone, as the canvas is not intuitive and needs explanation. However, we interpret this as an opportunity as being out of comfort zone could encourage learning behavior and deliberations and interactions among each other [34].

The second observation session focused on observing advisors using the web application for knowledge transfer and sharing. In the session, the participants were supported in using the SHARE instrument while they discussed a case. It seems as if they adjust their way of thinking towards the way the elements work together. The way that the instrument is designed and its intentional generalizable layout provoked the participants to discuss nuances. This aspect energizes the meeting, whereas the explanation working through the exercises in creating a new digital canvas required effort from the participants. Strong form of expert knowledge gained from experiential learning consisting of both canonical and noncanonical work practices and their discussions was observable from the sessions.

E. Client test sessions

We observed the SHARE system being used in two client advice sessions with an experienced legal advisor. Both clients signed the informed consent to participate in the observation session and agreed to a short interview after the session. One case concerns social benefits with part-time work; another concerns right to stay in the Netherlands after end of relationship. To integrate the SHARE system in the consultation, the procedure is divided into 3 stages: (1) preparation of the interactive canvas and working thoughts for the case context

acquired from the counter visit intake, (2) using the physical and digital canvases interchangeably during consultation, and (3) review the outcome of the consultation and integrate information into Webtop (which is the current system for registering case information). The research team did not give any other instructions on how to use the SHARE system.

Through observations of two client cases, we found that both the system and workflow have room for improvement, with some highlights from client feedback. The ad-hoc update of the canvases, given the case scenario, could be cumbersome yet necessary. Modifying the canvas template in the web application in preparation for a specific client takes approximately 5 minutes, as it involves reviewing the existing knowledge cards and choosing additional applicable others. The need to modify a template arose because of the currently limited number of templates. Over time, templates have to be made for all canonical cases to ensure broader case coverage. Modifying physical printed canvases requires manually manipulating the layout of knowledge cards on the PDF document. Another point of improvement is that the current advice print-outs lack proper formatting. The advisor resolved this by first creating the advice in SHARE, then copying it to Webtop where they could manipulate the layout, and then printing the advice from Webtop. This made this part less efficient in real-time consultations. For these reasons, the SHARE system still needs to be more integrated with the existing tools that the advisors have to use due to standard practices in the organization currently, both in terms of procedure and infrastructure.

However, both clients provided positive feedback on the utility of the canvas, particularly the paper version, and the shape chips (as part of the Shape Language kit, see Sec. III-B1). In one case, the chips played a significant role in guiding discussions around work and social benefits. After several attempts at verbal explanations, the advisor used the chips to demonstrate and clarify the different components of income, which the client understood. These tools were deemed

helpful in providing a clear and comprehensive overview during the consultations. One client indicated that she saw great potential in using the shape chips as they could symbolize certain concepts and facilitate understanding (translated from Dutch and paraphrased from original verbal feedback).

F. Limitations

1) *Bias in results:* Despite the general positive trend in how SHARE is perceived by the users at the Legal Desk, there are several sources of bias. In our practice-led approach, we are often deeply embedded in the research process both as a practitioner and an investigator. This dual role blurs boundaries between personal preferences and professional priorities and objective research goals. This likely has an impact on our evaluation of the prototype. While we mitigated these effects through the use of existing questionnaires to avoid leading questions, anonymous submission of the questionnaire, and leveraging the only non-Dutch and non-Dutch speaking researcher to conduct the user tests, these biases would still exist in our results. The use of the only post-task questionnaire is also less ideal due to the lack of objective measures of the consultation and learning process and the shortage of advisor participants (which is a niche group) who are already overloaded with work. More objective assessment of the prototype could be achieved through a scalable roll-out and experimentation based on procedural measures such as task completion time, and qualitative and quantitative metrics of legal advises. The management of the Legal Desk would have to agree with the time investment of their advisors at the cost of offering support to their clients. The evaluation of the system may need to become a continuous effort if and when they decide to roll out the system in the organization.

2) *Mode of interaction:* Because the SHARE prototype exists in two formats, a physical printout paper version and a web application version, one experienced advisor has reported difficulty in deciding which format to use, which suggests an ambiguity in the purpose of use of either of the two formats.

In the post-session interview, the advisor said that

“Well, [I prefer] the web version but only if it is complete. The online version, I cannot work as fast as that, ok I’m going to create something else right now. During the meeting with a colleague, it is possible. But with a client, it is difficult and it takes time...”

This implies that the paper version has a clear advantage compared to the web application version during the two consultation hours with real clients. During our observations (without providing instructions to the advisor), it was clear that the advisor made an effort to use both paper and web version. She also reported that there was a lot of juggling, bringing too much cognitive load to keep up with using both formats while trying to hold a conversation with the client. Another possible reason is the insufficient familiarity and training, particularly for adjusting an existing canvas or creating a new canvas with the web application in the little time they have for preparing for a consultation hour.

This limitation could be addressed by further optimizing the dual-format usage, and by providing clear guidance on when to use which format. With further testing for both the paper version, digital version, and their combination with control groups in the experimental setup and clearly defined metrics for efficiency and effectiveness (e.g., time to complete the same task), we could make a more informed decision based on the (dis)advantages of both formats.

In the meantime, the advisor also indicated the potential of using the system for training new colleagues.

“I think it will be useful to a new colleague...She will start advising for immigration law. It [the SHARE system] will be useful for learning and training and see how to do things. It’ll be easier than me telling them this is how it works.”

This statement corroborates the second observation session on assessing how SHARE contributes to enhancing organizational learning capacity, where group discussion and information exchange were observed. Even at this prototype stage, the advisor thinks that it will already be helpful in training with the existing form-factor and partial information (focusing on immigration law) in SHARE.

3) *Filling in the appropriate legal content:* In the current SHARE approach, an important challenge to address is to ensure sufficient coverage of legal frameworks and information. So far we have solicited information from the advisors and built the canvases manually with the advisors’ contributions. The question is to which extent we can extend the SHARE web application to streamline and (partially) automatically generate the sets of relevant questions, after which the advisors only need to review, revise, and order the knowledge cards on the new canvas and supplement it with their expert knowledge. Given the flexibility of the SHARE web application, the advisors could review and revise the automatically generated information and supplement it with their expert knowledge. Using this approach, the process could be more time-efficient than starting from scratch using google forms and manually setting up the knowledge cards, references, and explanations.

Using a toy example case provided by a legal advisor regarding the right to invoke legal presumption for labor, we found that automatically generated responses from large language models to the expert-provided working thought led to a largely overlapping set of knowledge cards compared to the ones provided by the legal advisor. We note that while the automatically generated responses are a feasible starting point for automating the creation of canvases, some pivotal questions are only present in the legal advisor’s approach. However, this provides us with an approach to scale the system beyond its prototype phase.

4) *Technology integration, maintenance, and ownership:* Paper and digital version of the SHARE learning system and their instructions are accessible and integrated into the Immigration Law department’s Microsoft Teams channel. There is an agreement with the research team for light maintenance of the current version of the web application, and possibilities to answer any questions related to use.

However, the web application is currently not integrated into the technology stack at the Legal Desk. The integration is challenging due to the existing third-party software company already maintaining the technical infrastructure for the organization. The research team has limited resource to interface with the software company together with the Legal Desk and comply with existing regulations. For this reason, we have explicitly instructed the advisors not to put any personally identifiable information of the clients into the SHARE system. To allow for scalable deployment and to ensure that any potential information of the clients remains within the Legal Desk for privacy reasons, the web application needs to be integrated within the existing infrastructure (i.e. Microsoft Azure services) in the future.

VII. DISCUSSION

A. Preserving the qualities of paper version of SHARE

As explained in the system’s evaluation, both the physical paper and the interactive web versions of canvases have their advantages and disadvantages. The question naturally arises if we can combine the advantages of both versions. The idea was formulated to use tablets running the application on the table between advisor and client as an option that comes close. This approach maintains the benefits of physical interaction while incorporating the advantages of the interactive web version, providing the client with a clear overview and structure during the consultation. However, the advantage of touching the shapes for enhancing the feeling of co-creating and ownership for both the advisors and clients would not be captured by the use of the tablet. Further research is necessary to enable situated real-time and multimodal understanding of the advisor-client interaction.

B. Generalization to other departments and organizations

Currently SHARE focuses on the immigration law department at the Legal Desk but can be generalized and adapted to other topics and organizations by leveraging its core principles of flexibility and knowledge-sharing. On a content-level, it would be straightforward to augment the existing immigration law with other legal topics (e.g., labor relations) at the Legal Desk, as we could query the Knowledge Bank. On the approach-level, many disciplines show similar ways of working, that focus on experiences (i.e., the transition from inductive reasoning to deductive reasoning as novices become experts). Novices gain from inductive reasoning to build experience through trial-and-error. Experts rely on deductive reasoning for efficient problem-solving, which starts from general principles or rules (in our case, the working thoughts) to specific cases. The SHARE system explicates the problem-solving approach and we envision it to cut down spent and wasted effort in learning from trial-and-error. SHARE elucidates and trains users in acquiring a type of strategic and structured knowledge that is crowd-sourced by the experts and built collaboratively and organically within the organization.

Taking these guiding principles of the SHARE system, organizations could adapt the content and approach to fit teams that wish to learn and train more efficiently.

C. Continuous engagement with the learning system: a mind-set for organizational learning

Engaging continuously with learning systems requires consistent and regular interaction with both formal and informal channels of knowledge, including structured training programs, peer collaboration and feedback, and personal development initiatives. Organizations like the Legal Desk must integrate multiple components to support systematic learning, such as a technology platform for storing strategic expert knowledge (e.g., SHARE), a strong learning culture that encourages exploration and idea-sharing, and leadership that prioritizes continuous learning as a core value.

From a technical perspective, we envision the SHARE learning system evolving towards being more automated through the integration of richer datasets and more advanced underlying algorithms. This trajectory aligns with a broader goal of embedding SHARE within a hybrid human-AI learning organization for future work. Building on the framework introduced by Tan et al. [35], the human-AI learning loop is designed to support a dynamic spectrum of knowledge exchange modalities. These range from traditional human-human interactions to collaborative human-AI learning, and even fully autonomous multi-agent AI-AI knowledge transfer. Each mode and learning pathway contributes uniquely to the hybrid human-AI system’s adaptability and capacity for continuous improvement, and foreshadows the potential of SHARE as a scalable learning platform.

From an organizational point of view, the full implementation of SHARE and the aforementioned human-AI learning framework involves aligning learning activities with strategic goals and existing work activities. Challenges such as time constraints, as seen in the Legal Desk’s immigration law department, can hinder consistent engagement. This should be taken seriously since these time constraints may also lead to the lack of integration of organization learning into existing organizational systems [31] and eventually missing the opportunity to develop a sustainable learning ecosystem between the various groups of professionals [29].

Overburdened advisors often have to prioritize immediate tasks over dedicated learning, making it difficult to balance work responsibilities with continuous education. Flexible learning opportunities, such as micro-learning sessions or workflow-integrated learning, can help mitigate these challenges. To this end, we believe the SHARE system has taken a step in demonstrating how learning can be integrated into the way of working for an organization with limited resources. SHARE enables a minimum setup of the hybrid human-AI organizational learning framework where employees become part of a learning organization and actively contribute to joint knowledge transfer and development without requiring significant change to the way of working.

VIII. CONCLUSION

In this paper, we introduced a novel interactive learning system designed to enhance legal consultation services and training at the Legal Desk. Using a co-creation approach, we collaboratively defined the problem of the organization's high turnover rate among legal advisors and developed a solution motivated by this critical challenge. Our proposed system, SHARE, integrates physical tabletop components with a digital web application. SHARE supports the explication of strategic expert knowledge on conducting efficient and effective consultation hours to provide their clients consistently with appropriate and customized advice. SHARE stores and presents that strategic knowledge to all advisors (experienced and less experienced) in such a way that less experienced advisors benefit from this strategic knowledge. Each component serves distinct purposes and leverages its unique strengths, working in synergy to achieve the desired outcomes for improved learning and consultation experiences for clients. We evaluated the prototype using a combination of user tests, observations, and interviews. We found a positive perception towards the prototype (further confirmed by the deployment of the current prototype in the organization) both from the advisors and from the clients point of view. We discussed the limitations of the prototype and suggested potential future work. These include designing and measuring more objective measures and scaling up experimentation with more users. Overall, our findings highlight the potential of SHARE as an effective instrument for addressing organizational learning challenges by enhancing legal consultation experiences and training. Future iterations of the system can be further refined for impact and scalability, paving the way for broader adoption and sustained benefits within the Legal Desk. The system can also be extended and adapted for other organizations that experience similar knowledge erosion problems and users that do similar types of knowledge-intensive work as legal advisors.

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