

Can Business Process Modeling Support Legal Decision-Making in Practice?

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Abstract—Despite the various potential benefits of diagrammatic representations in the legal domain, empirical evidence of their suitability for use by legal professionals is still scarce. In this paper, we address this gap specifically for BPMN models representing a complex and highly specialized procedure in the Brazilian legal system. We assess whether the model can be used by legal professionals to guide decision making correctly. We further investigate whether the process model is perceived to be easy to use, useful and whether there is an intention to use the artifact, following the guidelines of the Technology Acceptance Model (TAM).

Index Terms—Process Modeling, Legal Decision Making, BPMN, Technology Acceptance Model, Empirical Study

I. INTRODUCTION

The legal domain is extremely complex, characterized by highly specialized conceptualizations and processes across various branches of law. This richness of concepts and procedural complexity makes knowledge management essential to ensure adequate organization and accessibility of legal information. Over the past decades, these challenges have driven significant efforts to improve efficiency and understanding in this field.

In particular, there have been calls to develop and employ *information visualization* strategies for legal knowledge as a means to facilitate the communication of complex legal ideas [1], [2]. Despite the potential of visualization techniques for the legal domain, a recent literature survey [3] covering two decades shows that information visualization in legal literature remains “extremely rare”. The survey concludes with an interesting provocation: “how we can expect communities to understand and adhere to laws that have become so complex and verbose as to be incomprehensible even to many of those who are learned in the law?”

The potential of visualization techniques in the legal domain also extends beyond knowledge management as discussed in [4], which argues that the representation of the implicit structure of legislation and legal processes could support the development of legal AI applications. This is because

these representation techniques facilitate the formalization of otherwise “incomprehensible text” [4].

Despite the various potential benefits of diagrammatic representations of legal knowledge, empirical evidence of the applicability of these diagrammatic representations is scarce. In this paper, we take a small step toward filling this gap by assessing whether business process modeling can support legal professionals in grasping the key aspects of a complex legal procedure. Instead of a custom legal visualization technique (such as lawmaps [4]) we use here a general-purpose BPMN diagram.

We have developed a BPMN model to capture the decision process for a specific type of appeal in the Brazilian legal system, namely a *Request for Standardizing the Interpretation of a Federal Law*, which belongs to a specialized area of the Brazilian Federal Judiciary (Federal Special Courts). More specifically, we address the admissibility of this form of judicial appeal, which is a highly specialized procedure.

Within the context of the Federal Special Courts in Brazil, litigants may contest unfavorable decisions issued by Appellate Panels by alleging inconsistencies with established legal precedents. In such cases, they submit a Request for Standardizing the Interpretation of a Federal Law (referred to hereafter as RS). The admissibility of the RS is then first examined by a federal judge before the request can be forwarded to the National Uniformization Panel (TNU). Examining the admissibility of such appeals needs to consider many elements (as prescribed in Article 14 of Law No. 10.259/2001 and related infra-legal statutes), and has many possible legal outcomes.

Our evaluation was conducted in two stages. The first involved qualitative interviews with experts in the specific legal procedure that was modeled, and aimed to ascertain whether the process model was accurate with respect to the legal procedure. The second consisted of a questionnaire that was applied to a larger number of professionals that were not

necessarily acquainted with the legal procedure. The questionnaire aimed to answer our main research question: whether the developed process model could indeed support legal decision making for the procedure considered. The questionnaire was structured into two overall sections: the first one to establish whether the participants could correctly determine the legal outcome of admissibility of five appeal situations; and the second one concerning a subjective evaluation of the model based on the guidelines of the Technology Acceptance Model (TAM) [5], assessing the participants' perceptions of *ease of use*, *usefulness* and *intention to use*. The results indicate that legal professionals are able to employ the BPMN model in determining the correct outcome of legal cases and are favorable to adopting the artifact.

This paper is further structured as follows: Section II introduces the process model that is the object of our study; Section III presents the evaluation procedure, results and discussion; Section IV positions this work with respect to others in the literature; and finally, Section V provides conclusions, highlighting potential areas for further investigation.

II. USING BPMN TO MODEL THE RS LEGAL PROCESS

The construction of the model followed a rigorous conceptualization process, incorporating normative elements and domain-specific practices, and was refined iteratively with feedback from legal experts. The BPMN diagram has the dual role of being a documentation tool and a potential support mechanism for legal practitioners engaged in the admissibility assessment, offering a structured and accessible way to navigate legal requirements that are conveyed in dense text.

The model represents the procedure of admissibility analysis in accordance with the Internal Regulations of the TNU (Resolution No. 586/2019). The process diagram can be seen in Figure 1. It covers from the filing of an RS (a "case") to an admissibility decision for that RS, with the final events denoted by red circles. The full analysis process was represented by a BPMN pool. Each lane selects the part of the process which may lead to a particular outcome for an RS, namely: 'Not heard', 'Suspended', 'Not Entertained', 'Granted to Revoke Decision', 'Not Accepted' and 'Accepted'. Each color for a gateway represents a different aspect of the analysis of an RS as explained in the legend of Figure 1. (Note that BPMN does not provide a specific semantics for lanes, and they can be used flexibly for various purposes [6]). They are often employed to represent systems or departments through which activities flow, or to indicate internal roles responsible for performing the activities in each lane. Since the objective of this diagram is to establish the decision process which can be executed by a single actor—a judge or a clerk—we have leveraged lanes to emphasize the outcomes of the decision process.)

The process model was developed in alignment with a reference ontology for this domain [7], [8]; it includes a taxonomy for this type of appeal, the types of actors which participate in the legal process, and the outcomes which are represented as *historical roles* for the RS after it has been analyzed for admissibility (for details, see [9].)

III. EMPIRICAL VALIDATION

A. Qualitative Validation

The first stage of the evaluation (which may also be seen as a pre-validation) consisted of qualitative interviews with four experts in the selected legal procedure. The participants are legal advisors (clerks) to Federal Judges responsible for managing the admissibility of the selected appeal in Regional Federal Courts across three different regions of Brazil and a legal advisor from the TNU presidency. These experts have over seven years of experience handling the admissibility of this specific type of appeal. Each one-on-one interview started with a presentation of the diagram, explaining its notation, and walking through the represented decision process. The experts confirmed the model accurately represents the legal provisions for this type of procedure, with small corrections pointed out. These corrections led to minor modifications in the process model before the start of the second evaluation cycle.

Some reflections concerning the applicability of the process were also encouraged during the interview. Participants expressed strong interest in using the diagram in their professional routines and praised its development. They also expressed a desire to see similar diagrams created for other types of appeal or motions for clarification and to support organizational workflows.

B. Quantitative Validation Methodology

The second stage of the evaluation was based on a quantitative survey with a larger number of professionals (not necessarily acquainted with the procedure), aiming to assess the participants' understanding of the diagram as well as their perceptions using variables of the Technology Acceptance Model (TAM) [5]. The evaluation focused on three key constructs: *perceived usefulness* (PU), *perceived ease of use* (PEOU), and *the users' intention of use* (IOU) the artifact. According to TAM, *perceived usefulness* refers to the degree to which a user believes that using a particular system would enhance their job performance, while *perceived ease of use* concerns the level of effort required to use the system. Together, these factors influence the user's behavioral *intention to adopt* the artifact, especially in organizational contexts where performance is often linked to external rewards such as recognition, promotions, and career advancement.

The survey included a questionnaire that was divided into six parts: (i) consent form: it aims to protect the participants' rights to anonymity and to formally state the intended academic use of the study and its results; (ii) profile questions: 10 questions to outline the participants' profiles, aiming to obtain information about the participants' previous knowledge and experience concerning Law in general, concerning the specific legal procedure which is the object of the study (admissibility of appeals directed to the TNU), and concerning process modeling notation (more specifically BPMN); (iii) Section 1: five questions on legal cases to ascertain whether the participants can use the process model to establish the outcome of these cases (which we term 'model comprehension

questions’ in the remainder of the text); (iv) Section 2: seven questions to assess the perception of ease of use; (v) Section 3: ten questions aimed at perceived usefulness; (vi) Section 4: three questions aimed at the intention of use of the artifact. The complete questionnaire is available (in Portuguese)¹.

Legal contextualization was provided in text following part (ii) of the questionnaire, as well as a short explanation of the basic elements of the BPMN notation for process modeling.

Participants were instructed to answer the model comprehension questions using only the diagram, without consulting the normative text. The questions were designed with increasing levels of difficulty. The initial questions were intentionally simpler, serving as a means to familiarize participants with the diagram. The remaining questions were domain-specific and even familiar to participants with a legal background. However, answering them still required careful examination of the diagram since consulting the corresponding legal text was not allowed.

The questions in parts (iv) to (vi) of the questionnaire respectively focused on *perceived ease of use* (PEOU), *perceived usefulness* (PU), and *users’ intention of use* (IOU) of the artifact. These questions were designed using a 5-point Likert scale [10], ranging from 1 (“*strongly disagree*”) to 5 (“*strongly agree*”). To minimize potential bias, the questions alternated between positive statements, such as “the representation is easy to understand,” and negative statements, such as “the representation is prone to errors.” In order to ensure consistency in the numerical coding, the responses to negatively worded items were reverse-coded. The mean and standard deviation were then calculated for each variable (PEOU, PU, and IOU) to determine the final results.

Several days prior to the experiment, we conducted a pilot, sending the questionnaire to three legal experts to confirm the estimated response time (15 to 20 minutes) and to gather feedback on potential issues or errors. Minor revisions were made based on their feedback and incorporated into the final version of the questionnaire.

The study was conducted through the administration of a questionnaire, which was distributed online in a private and in an individual manner to most of the selected participants via WhatsApp and e-mail. Additionally, the questionnaire was shared on the author’s LinkedIn profile and reshared twice by colleagues. A few participants also suggested forwarding it to other professionals working in the legal field. Access to the questionnaire was provided through a link on the QuestionPro platform. The data collection period was set from November 14 to 20, 2023.

C. Participant Demographics

Fifty-nine responses were received during the one-week data collection period. An initial screening of all questionnaire responses was conducted to identify any responses that could compromise the validity or reliability of the study. One response was excluded due to the use of a smartphone,

as the limited screen size was considered incompatible with the diagram’s complexity and scale. Four participants were excluded due to prior exposure to the diagram. Additionally, responses from individuals without a background in Law were excluded. These included a bank employee and a civil engineer, while a psychologist who attempted to participate reported that the content was too specialized to complete the questionnaire. After these exclusions, 52 valid responses remained for analysis.

Participants’ ages ranged from 18 to 64 years, with most within the 35 to 54 age range. The majority of participants reported holding a postgraduate degree: 26 had completed a *Lato Sensu* specialization program, 3 held a Master’s degree, and 5 held a Doctorate degree. When asked about their familiarity with the National Uniformization Panel (TNU), 48.08% of respondents stated they were very familiar with it, while 36.54% reported having heard of it and being somewhat familiar. Additionally, 7.69% indicated they had heard of it but were not familiar with its purpose or functions. Only 5.77% stated they had never heard of the TNU, and 1.92% reported not knowing or being unsure.

Eighteen participants reported that they currently work or have previously worked directly with the admissibility analysis of RS. Among those with past experience, the average duration was 15 months, while those currently working in this area reported an average of 26.5 months (just over two years). There was significant variation in participants’ experience, ranging from individuals with only one month of involvement to others with 8 months or even 11 years of experience. This diversity contributes to the representativeness of the sample. Participants from 14 different cities across Brazil took part in the survey (Figure 2), representing a total of 8 Brazilian states. In terms of Federal Regional Court (TRF) jurisdictions², respondents came from 5 out of the 6 regions (Figure 3). The chart values are approximate and were rounded to one decimal place; therefore, the totals may not add up to exactly 100% due to rounding.

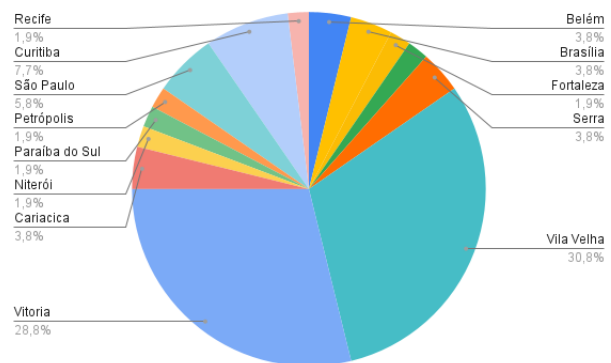


Fig. 2. Participants from 14 different cities across Brazil.

²At the federal level of the judiciary, Brazil is divided into six jurisdictions, each under the responsibility of a Federal Regional Court (Tribunal Regional Federal – TRF), covering specific states of the federation.

¹<https://github.com/MelissaZor/CBI2025/tree/main>

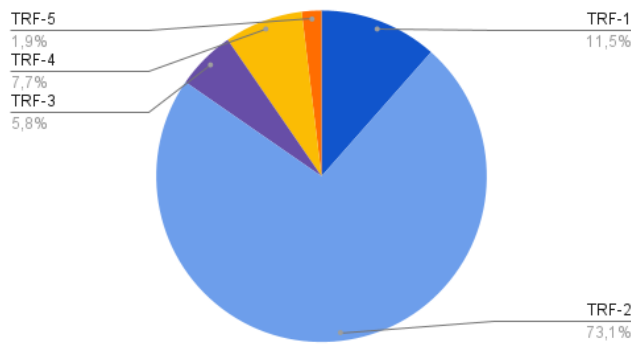


Fig. 3. Distribution of participants across five of the six Federal Regional Court (TRF) jurisdictions.

The majority of participants (about 67%) are employed in federal institutions. Only 14% reported working in state-level institutions. Additionally, about 19% indicated that they are not affiliated with any court or justice-related body. It is important to note that 9 individuals chose not to answer this question, in accordance with the survey instructions, which requested a response only if the participant was employed by one of the two types of institutions mentioned. Among the participants, only about 12% had previously used the BPMN notation, and none of these currently work or have worked with admissibility analysis. Four participants from the legal field who are not involved with admissibility reported having used the notation.

D. Results

The results presented here are based on responses from the 52 participants included in the final analysis.

As aforementioned, **Section 1 of the questionnaire was aimed to assess participants' understanding of the model created based on the current normative framework/diagram.** In this part, respondents were instructed to keep two browser tabs open simultaneously, one displaying the questionnaire and the other the diagram. Five questions were developed for this purpose. Looking at the results, 96.1% of the participants responded the first question correctly; 84.6% got the second question right; 92.3% of the respondents selected the right option for the third question; 96.1% of the participants responded correctly the fourth question; and finally, 62.7% of respondents selected the right option for the fifth and last question. We expected lower percentages of correct answers for the last question, as it was intentionally designed to be more specific and potentially more difficult, targeting those with direct experience in the field.

The overall performance in **Section 1** indicated a high level of comprehension. Aggregated responses from all participants showed a correct answer rate of 85.8%, while the error rate was 14.2%. These results suggest that the majority of participants were able to accurately interpret the information represented in the model, as illustrated in Figure 4.

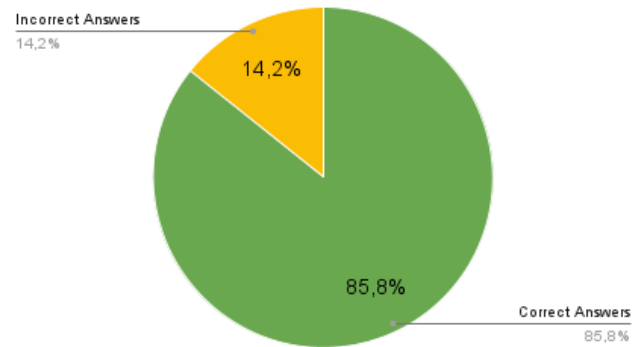


Fig. 4. Correctness of **Model Comprehension** Questions

Section 2 of the questionnaire aimed to assess the perceived ease of use of the developed artifact. Participants were presented with seven statements and asked to indicate their level of agreement using a Likert scale [10]. The following statements were presented: (1) The diagram is easy to understand; (2) I found the diagram confusing; (3) I found the diagram intuitive; (4) It will be easy to remember how to use the diagram; (5) I found the diagram complicated; (6) I believe the representation proposed in the diagram is prone to errors; and (7) Overall, I consider the proposed diagram easy to use. The responses were aggregated, in such a way that the answers to the negatively formulated questions were inverted: thus answering 'I strongly disagree' to '(5) I found the diagram complicated' amounts to a positive answer concerning ease of use. A total of 74.8% agreed that the model was easy to use, 16.9% were neutral with respect to ease of use, and 8.3% disagreed that it was easy to use (Figure 5).

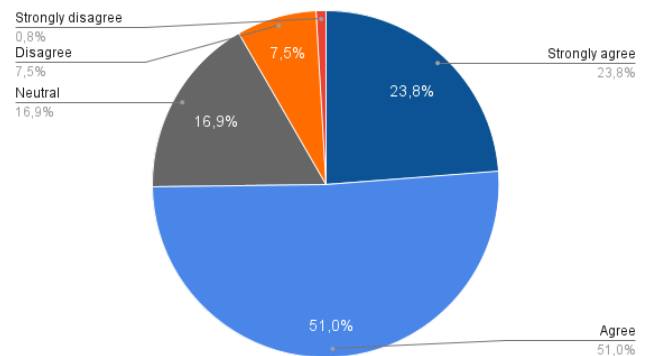


Fig. 5. Summary of **Perceived Ease of Use**

Section 3 of the questionnaire requested participants to evaluate the perceived usefulness of the process diagram in practical contexts. A set of ten statements was presented, and participants were asked to express their level of agreement using a five-point Likert scale [10]: (1) My admissibility analysis would be more challenging without using the proposed diagram; (2) Using the proposed diagram would give me greater understanding of the admissibility of the Request

for Standardizing the Interpretation of a Federal Law (RS); (3) Using the diagram would hinder my job performance; (4) Using the diagram would improve decision-making related to the analysis of admissibility; (5) Using the diagram would allow a more accurate admissibility analysis; (6) The proposed diagram would meet my consultation needs regarding Article 14 of Resolution 586/19, which concerns the pre-admissibility of the RS; (7) Using the diagram would make the admissibility work more difficult; (8) The diagram is not very clear; (9) Using the diagram would improve the quality of service related to the admissibility of the RS; and (10) Overall, I consider the proposed diagram useful when working with the admissibility of this type of appeal. Figure 6 presents the aggregated results: a total of 85.4% agreed the model was useful, 9.8% remained neutral, and 4.8% disagreed that the model was useful.

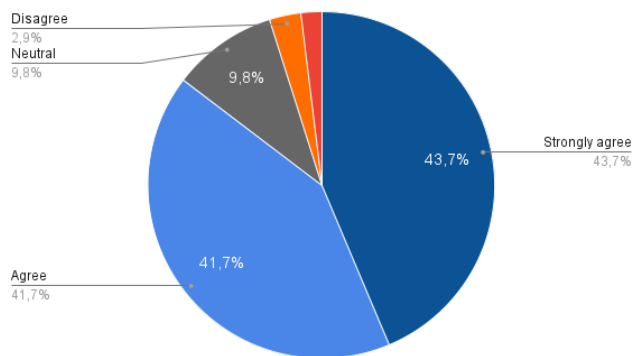


Fig. 6. Summary of all participants – Perceived Usefulness

Section 4 of the questionnaire is related to the intention to use the artifact. Three Likert-scale statements were formulated [10]: (1) I think I would like to use this diagram frequently; (2) I would definitely not use this diagram to interpret Article 14 of the TNU’s Internal Regulation; and (3) I intend to use this diagram to complement the understanding and interpretation of Article 14 of the TNU’s Internal Regulation. Regarding the intention to use the diagram, compiling all responses received, a total of 84.6% agreed that they intend to use it, 10.9% were neutral, and 4.5% indicated no intention of future use (Figure 7).

Table I summarizes the results with mean and standard deviation (SD) for the TAM variables: perceived ease of use (PEOU), perceived usefulness (PU), and intention to use the artifact (IUO). The comparison between the two groups will be presented in Section III-E.

TABLE I
PROCESS MODEL EVALUATION RESULTS

| Group | N | Ease of use | | Usefulness | | Intention to use | |
|---------------------------------------|----|-------------|-----|------------|-----|------------------|-----|
| | | Mean | SD | Mean | SD | Mean | SD |
| Experienced with RS Admissibility | 18 | 4 | 0.9 | 4.2 | 0.8 | 4.2 | 0.7 |
| Not Experienced with RS Admissibility | 34 | 3.8 | 0.9 | 4.2 | 0.9 | 4.2 | 0.9 |
| All Participants | 52 | 3.8 | 0.9 | 4.2 | 0.9 | 4.2 | 0.8 |

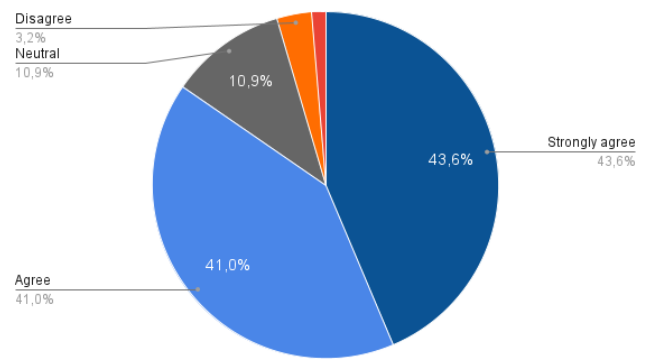


Fig. 7. Summary of all participants – Intention to Use

E. Discussion

Participants from different professional backgrounds responded to the survey. For the analysis, they were divided into two main groups: (1) those who currently work or have previously worked with admissibility, hereafter known as **professionals with previous experience in admissibility** and (2) **professionals with no experience in admissibility**. In what follows, we discuss the results of Section 1 to 4 (see subsection III-B) of the questionnaire for each of these two groups.

Group 1 – Professionals with previous experience in admissibility. This group consists of 18 participants, i.e. 34.6% of the research sample. It is heterogeneous, being composed of various legal professionals, including federal judges (3), public servants (8), lawyers (2), interns (4), and legal residents (1).

Receiving feedback from this experienced group is essential for the development and application of the proposed diagram based on the normative framework.

None of the participants in this group reported having used BPMN before. Among the 18 participants, 5 stated that they accessed the text of the normative document while answering the questionnaire. Although we cannot determine their exact reasons, we infer from the general comments provided by participants that possible explanations include *the need for support, a sense of uncertainty, the perceived importance of the document, or familiarity with the norm when performing analytical tasks*. It is also possible that some did not pay attention to the instructions in the questionnaire. Among those who felt the need to consult the normative text, 2 answered one question incorrectly, while the other 3 achieved a perfect score.

Although the system used for the questionnaire (free version of QuestionPro) recorded the response time, some inconsistencies were observed, preventing precise use of this parameter. Among the six participants who reported having worked with admissibility, one had a clear timing error. For the remaining five, the average response time was approximately 21 minutes and 31 seconds. Among the 12 participants who work with admissibility, a timing error was identified in the system record

of one response. For the remaining 11 participants, the average response time was approximately 34 minutes.

Among the participants, (i) 4 had contact with the topic (of admissibility) within at least 6 months, 7 between 6 and 12 months, and 6 for over 12 months, while one did not indicate the time frame; (ii) 2 participants in this group also reported working with information technology.

a) Section 1 – Model Comprehension and Case Analysis. Regarding the model comprehension questions, the performance in terms of errors and correct responses is presented in Figure 8. Group 1 achieved a 94.4% correctness rate and Group 2 a total of 82.6% (Figure 9).

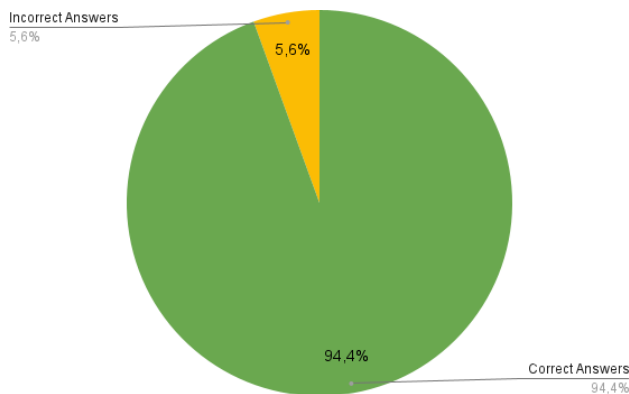


Fig. 8. Correctness of Model Comprehension Questions - Group 1

For Group 1, the percentage of participants who made mistakes was low, accounting only for 27% of the total. No participant made more than one mistake, resulting in a total of just five errors. Only one participant, who has been working with admissibility for one year and five months, responded incorrectly to the last question. Based on these results, we can infer that those who had previously worked with the admissibility analysis of the RS appeal performed better than those currently working in the area, likely due to greater experience. The period of previous experience ranged from 7 to 24 months, while current experience ranged from 1 to 132 months.

b) Section 2 – Perceived Ease of Use. Regarding Section 2, which assessed the perceived ease of use, most responses were positive. Participants generally found the artifact intuitive and accessible, indicating that the model based on the legal norm was easy to understand and apply, despite none of them having experience with BPMN.

c) Section 3 – Perceived Usefulness. For the perceived usefulness of the artifact, there were fewer neutral responses compared to ease of use. In this case, only 13.3% of the responses were neutral and just 1.7% were unfavorable, while 85% of participants considered the diagram to be useful. We highlight that the final statement (*the diagram was considered useful when working with the admissibility of RS*) received exclusively positive responses except for one neutral answer.

d) Section 4 – Intention to Use the Artifact. A total of 83.3% expressed an intention to use the diagram, while 16.7%

provided neutral responses. Notably, there were no negative responses, indicating that all participants mostly had positive views of the model.

e) Participants Comments. In this group, participants left both positive feedback and suggestions in the open-ended field provided at the end of the questionnaire. Valuable recommendations included using different colors for the ‘yes’ and ‘no’ arrows leaving gateways, as well as changing the background color of decision outcomes.

One of the participants made a deep analysis of the diagram, as illustrated by the following comment [translated from Portuguese]: ‘*Regarding the analysis of formal requirements, when a requirement is missing, based on Article 14, item V, the next step would be to dismiss the PU. However, the diagram does not distinguish each requirement according to its corresponding subparagraph. For example: missing copy—dismissed under Article 14, V, subparagraph b.*’ The participant is correct and provided an excellent suggestion to improve the diagram by incorporating more detailed references to the legal provision.

Examples of positive feedback include: ‘*The idea of the flowchart is brilliant; it facilitates the work and allows for faster and more accurate consultation regarding the admissibility analysis of the PU. (...) I believe justice would be less slow and less inaccessible to those unfamiliar with legal language. This diagram reflects a strong commitment to contributing to justice and supporting the work of colleagues. Congratulations! I hope it is implemented.*’ Another participant stated, ‘*I believe the diagram is very useful for those who better understand things visually or who are coming into contact with Article 14 (...) for the first time through the diagram.*’

Group 2 – Professionals with no experience with admissibility. This group consists of 31 individuals (59.6% of the sample). Their ages range from 18 to 64 years, and their educational backgrounds include incomplete or completed higher education, postgraduate (*lato sensu*), master’s, or doctoral degrees. The group also includes three professionals who work exclusively in the field of information technology.

It is important to evaluate how these professionals perform even without being experts in the specific domain. This approach allows us to examine their perception and use of the diagram-based tool as a support mechanism, despite lacking direct experience or formal training related to the artifact’s focus (admissibility of the RS).

The group is diverse, being composed of various professionals, including lawyers (5), a Federal Attorney (1), federal judges (2), an appellate judge (1), federal (16) and state (3) public servants, law interns (2), a law student (1), and professionals or Professors in the fields of Information Technology or Computer Science (3).

a) Section 1 – Model Comprehension and Case Analysis. When comparing the performances of the two groups, the observed difference was expected, since Group 1 consists of individuals currently or previously engaged with the specific

legal matter addressed in the study. However, this difference was not statistically significant.

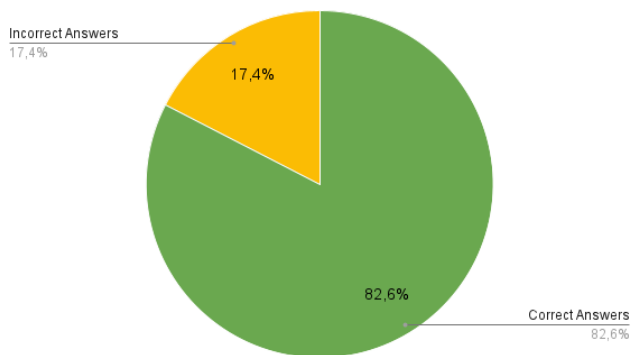


Fig. 9. Correctness of Model Comprehension Questions - Group 2

Focusing on the legal professionals in Group 2, for the introductory question, which was formulated in a simpler manner, only 2 out of 31 respondents answered incorrectly, resulting in a 93.5% accuracy rate. The second question, which was more complex and required greater use of the diagram, had an 83.9% accuracy rate, with five incorrect answers. The third question had just two incorrect responses, totaling 93.5% accuracy. The fourth question yielded three incorrect answers, with a 90% accuracy rate. The fifth and apparently most challenging question had a 54% accuracy rate, with 14 participants answering it incorrectly and 17 answering it correctly.

The accuracy rate of participants with experience with admissibility is 11.2% higher than that of legal professionals with no experience in this area. Despite this difference, both results were quite positive, with over 83% accuracy in both groups. This demonstrates that the diagram was well understood, as 26 out of 31 participants in Group 2 did not consult the legal text, meaning that 83% did not feel the need to read the normative provision while using the diagram, even though they are not experts in this specific legal area. In comparison, 13 out of 18 participants in Group 1 also did not consult the norm, representing 72.2% who did not need or wish to access the text to answer the questionnaire.

Five of the seven participants who reported having no familiarity with the TNU made at most two mistakes. Two of them answered two questions incorrectly, and the remaining three missed only one. The average accuracy among these seven participants was 80%. Two of them had previous contact with BPMN, and one of these participants answered only one question correctly, resulting in 10% accuracy.

The participants who stated that they did not consult the legal text (26 in total) presumably relied solely on the diagram to complete the questionnaire. These participants achieved an 85.6% accuracy rate, while those who opened the legal text (five) had an 80% accuracy rate. Even though this was a group of professionals who had never worked with admissibility

before, using the diagram led to a percentage of correct answers that was twice as high as the percentage of errors.

b) Section 2 – Perceived Ease of Use. Regarding the perceived ease of use, 72.2% of this group evaluated the diagram positively. In contrast, 11.1% reported that they did not find its use particularly easy, while 16.9% provided neutral responses. It is worth noting that this group showed a greater number of neutral responses overall compared to Group 1. One participant did not feel comfortable evaluating the ease of use of the artifact, remaining neutral in 9 out of 10 responses.

The perceived ease of use yielded similar percentages across both groups. However, in Group 2 11.1% did not find the diagram easy to use, a relatively low percentage. In contrast, in Group 1, which consisted of participants with prior experience on the topic, only 3.2% found it difficult to use (even lower percentage when compared to Group 2). Thus, we can state that in general, participants found the diagram easy to use.

c) Section 3 – Perceived Usefulness. Regarding perceived usefulness, a high number of participants in Group 2 (84.9%) considered the process diagram to be useful. There was less neutrality in responses concerning usefulness (8.1%) compared to ease of use, and fewer participants found the diagram not useful (6.8%) than those who found it not easy to use (11.1%).

One of the comments received at the end of the study stated: *“I do not work with this subject, but I believe that through the diagram I was able to get an overview of the topic. I believe it can be quite useful for those who work with it...”* Another participant commented: *“In my overall assessment, I consider the approach to be very useful and capable of structuring the various states of affairs and the possible decision flows.”*

In response to the statement “The proposed diagram would meet my consultation needs regarding Article 14 of Resolution 586/19, which addresses the pre-admissibility of Request for Standardizing the Interpretation of a Federal Law,” many participants gave neutral responses. However, the majority of responses were quite positive. In terms of perceived usefulness, only 1.7% of participants in Group 1 did not find the diagram useful, compared to 6.8% in Group 2. Therefore, we may state that, overall, participants found the diagram to be useful.

d) Section 4 – Intention to Use the Artifact. Regarding the intention to use, the vast majority of professionals reported an intention to use in the future (83.3%), while only 7.6% responded unfavorably on this point. Neutral were 8.6%. The percentages of disagreement and agreement concerning the intention to use are clearly shown. All responses to the three statements related to the intention to use from Group 2 are presented. The first row defines whether the statement was positive or negative, the second row contains the statements themselves, and the following rows show the participants’ responses. It is observed that there are only two unfavorable responses and few neutral responses, with the large majority being positive and favorable toward the intention to use.

Regarding Group 1, for the first statement about frequently wanting to use this diagram, 5 out of 18 participants were neutral. No participant responded negatively. In Group 2, 4 out of 31 participants were neutral, and 2 participants gave a

negative response concerning the intention to use the diagram. It is not possible to know whether this is because they do not work or do not intend to work with the subject, but one of them, despite responding negatively to this statement, agreed that “Overall, I consider the proposed diagram useful when working with the admissibility of National Uniformity Requests.”

Therefore, in general, the responses were very positive. In Group 1, there were no negative responses, and 16.6% were neutral regarding the intention to use. In Group 2, there was a small percentage of negative responses concerning the intention to use (7.5%), with 8.6% neutral and 83.8% positive.

e) Participants Comments. In the case of this group, comments were made regarding the complexity and size of the diagram. One of the comments links the diagram’s complexity to the intrinsic complexity of the procedure itself: ‘*I even saved the diagram because I found it very interesting. (...) As a tool for RS, it is excellent! I just thought the diagram as a whole was a bit extensive, but that is also due to the complexity of the appeal, involving the application of precedents from the TNU, STF, and STJ, in addition to admissibility and merits. The topic is excellent*’. There were two very positive comments in which participants reported their intention to implement and use a similar approach in their daily work at a criminal court.

F. Study Limitations

As with most empirical studies, this research is subject to certain limitations that may affect the validity of its findings. These limitations are discussed here in light of the classification proposed by Wohlin [11], covering internal, external, construct, and conclusion validity.

Internal validity may have been threatened by factors such as communication between participants, limited time to complete the questionnaire, lack of participant engagement, social desirability bias. Measures were taken to mitigate these risks, including providing explanatory instructions, ensuring a reasonable response window, and recruiting a diverse sample of professionals.

External validity, which concerns the generalizability of results to other populations [12], is limited (when considering legal professionals in general). To mitigate this threat, the sample included professionals from different regions of Brazil, with different levels of experience. However, some selection bias may have affected the results, as personal contacts were used for recruiting participants. Given that the full population of those that are experienced with this sort of procedure (RS admissibility) is rather small, the sample for this particular group is considered representative.

Construct validity was addressed by clearly framing the theoretical context and instructing participants to rely solely on the BPMN diagram when answering questions. With respect to the subjective (TAM-related) questions, it is possible that the participants (favorable) responses were influenced by their enthusiasm or desire for success, and hence participants may have overestimated usefulness. This was mitigated by designing the questionnaire with legal cases with increasing levels

of difficulty, and participants were instructed to answer these comprehension questions using the model before they have answered the subjective questions on the artifact. Although the study could not be conducted under fully controlled conditions, anonymity and non-disclosure measures were implemented to preserve the integrity of responses. An issue remains on whether TAM variables are suitable in general for the assessment of an artifact such as a model instead of an IT system. It is worth noting this is not the first study to assess modeling artifacts using post-task TAM variables, and we have drawn inspiration from [13].

Conclusion validity was potentially affected by the sample size (52 participants) and the fact that not all respondents worked directly with admissibility analysis. Nonetheless, participants from relevant judicial institutions were included, enhancing the reliability of the conclusions drawn.

IV. RELATED WORK

As stated by McLachlan and colleagues [4], “*lawyers make countless decisions in the course of daily practice. Decisions about the relevant legal provisions that apply to a given matter, the scope of advice they give, the investigations they undertake on behalf of their client, and the context of submissions they draft. [...] While there have been numerous calls to develop approaches and train lawyers using infovis [information visualization] [...], these calls presently remain unanswered [...]*”. We agree with this statement and our work started by trying to fill in this gap [9].

BPMN diagrams are effective visual models to represent processes and is applied in different domains. The use of BPMN in the legal domain is emerging as a promising approach for modeling and managing complex processes, particularly in the context of *document workflows* and *regulatory compliance* [14]–[17]. Our work has a different application, focusing on the use of BPMN models to support *decision-making* during a legal process. This has implications in the modeling choices that we make. For example, in most related works, BPMN lanes represent roles, focusing on multi-actor workflows. However, our model (see Fig. 1) applies lanes to model each stage of the process, supporting the model users in making the decisions they should in each of these stages.

[18] compares BPMN and DEMO for modeling certain aspects of legal documents. It uses these models to represent legal process and concludes that both techniques have advantages and disadvantages. This method is useful when writing new laws or revisiting old ones, again a different application when compared to our work.

In the context of using BPMN as a visualization tool, one of the key findings reported by [19] is that BPMN is a standardized language with a large base of proficient users. This facilitates the interpretation of process diagrams, enabling users to comprehend the full intent of a legal provision through its graphical representation alone.

Although visual models (such as those represented in BPMN) are becoming more and more common in the representation of legal processes, empirical evidence proving the

success of their practical use are still lacking. There are notable exceptions, such as [20], which discuss approaches to evaluating legal visualizations, drawing on methods from business informatics, and presents a research project on visualizations for communicating mobile contract content, thereby contributing to the empirical basis of legal visualization.

A literature review in 2017 mapped the status of legal visualization approaches at that time, highlighting the lack of common standards and pointing out directions for research and practice [21]. The authors concluded that only few studies evaluated their artifacts, and this should be further explored. In a more recent survey conducted by McLachlan and Webley [3], the authors observed that they “were unable to identify any study that had evaluated the potential for visualisations to impact lawyers’ and clients’ understanding of [...] the law [...]”. This is the gap where this work is positioned.

V. FINAL CONSIDERATIONS

This study aimed to establish evidence concerning the applicability of process modeling to support decision-making procedures by legal professionals. We have employed a highly specialized procedure with complex legislation within the Brazilian Federal Special Courts system. The proposed model was developed based on the applicable normative texts and represented using BPMN. A two-phase study was conducted: first through qualitative interviews with domain experts, and subsequently through a quantitative questionnaire guided by the Technology Acceptance Model (TAM).

The results of both phases indicate that the model is effective in representing the normative procedure and supporting its comprehension. Experts who work directly with admissibility expressed strong interest in using the model in practice and suggested its expansion to other legal procedures. The questionnaire revealed high levels of *perceived ease of use*, *perceived usefulness*, and *intention to use the artifact*, both for among professionals with and without prior experience in this specific area of law.

The participants’ overall performance in correctly classifying putative cases using only the diagram suggests that the artifact improves accessibility to complex legal content. These favorable results were obtained despite the fact that legal professionals receive no formal training with respect to process notations such as BPMN. Further investigation would be interesting to evaluate whether domain-specific notations (such as lawmaps [4]) or other specialized notations (such as DMNs [22]) could be of further benefit to legal professionals in decision making. A controlled experiment contrasting the use of the diagrams with the use of legal text could further provide objective evidence of the benefits of these artifacts in legal decision making, and would give us more basis for inferences concerning the causal role of diagrams. Despite the limitations inherent to the study, such as sample size and self-selection bias, the findings support the model’s value as a tool to aid legal professionals in understanding and applying procedural norms.

Future work may involve assessing whether the favorable results can be obtained across different legal domains. We also intend to employ the process in AI applications to support legal professionals in admissibility analysis.

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