METHOD SUPPORTING THE ADOPTION OF VISUAL STO-RIES IN JUDICIAL SYSTEMS

Research paper

Leite, Francisco, ISEC - Coimbra Institute of Engineering, Portugal, cbl@isec.pt

Antunes, Pedro, Victoria University of Wellington, New Zealand, pedro.antunes@vuw.ac.nz

Guimarães, Nuno, University Institute of Lisbon, Portugal, nuno.guimaraes@iscte-iul.pt

Pino, Jose A., DCC - Universidad de Chile, Chile, jpino@uchile.cl

Abstract

The submission of statements of claim is a critical procedure in civil judicial systems, where plaintiffs plead the court to resolve conflicts with other parties. Under the assumption that plaintiffs seek to represent themselves, we are particularly concerned with the quality of the information exchange with the court. To address this problem, we develop a method for constructing statements of claim that uses visual stories. The research adopts design science research, focusing on method construction and evaluation in a set of experiments. The results suggest the method supports the construction of coherent statements of claim and contributes to promote self-help and visual narrative in judicial systems.

Keywords: Narrative Theory, Visual Stories, Visual Factual Stories, Judicial Systems.

1 Introduction

The simplification of legal services is essential to increase the affordability and accessibility of judicial systems (Goh, 2018; Rhode, 2015-2016). In particular, the concept of self-help, i.e. using information systems (IS) to help citizens representing themselves, especially in the area of civil justice, seems very compelling (Lupo & Velicogna, 2018; Procopiuck, 2018; Singh et al., 2018). However, by promoting self-help, we may foster a problem with the **quality of information exchange**: without professional legal assistance and knowledge about judicial processes, self-represented citizens may end up being unfairly treated because of poor information exchange with the court (Rhode, 2015-2016).

Since judicial systems are very complex, we have to delimit the scope of this research. Firstly, we only address the plaintiff's viewpoint. Secondly, we only consider small civil claims (Cortes, 2013). Third, we focus on a specific, albeit very important document, the statement of claim (Goh, 2018). This document is critical in small claims, as it initiates and sets the stage for the whole process: if it has gaps or unsupported claims, there is good reason for the court to immediately reject the case; and even if the case is accepted, its low quality may negatively impact the outcomes. Finally, we address the problem from a specific frame: visual narrative theory (Cohn, 2013, 2014; Cohn et al., 2012). Visual narrative theory explains how people create and analyze visual stories (Cohn et al., 2012). Visual stories are ubiquitous in society, helping people to understand events through visual cognition (Cohn, 2013). This theory has already been successfully applied in teaching (Green & Myers, 2010), medicine (Green & Rieck, 2013), business process management (Antunes et al., 2013; Simões et al., 2018; Simões et al., 2016; Simões et al., 2015), human-computer interaction (Sakamoto et al., 2007; Truong et al., 2006), and software engineering (Haesen et al., 2010; Williams & Alspaugh, 2008).

We posit that **visual narrative theory may also be useful in improving the quality of information exchange in judicial processes, in particular when plaintiffs represent themselves submitting statements of claim**. We propose a **method for self-constructing coherent statements of claim which uses**

visual narrative theory. Visual narrative is an area that is unexplored in the judicial domain, which emphasizes the originality of the proposal: no method like this has been proposed before.

Considering that the method is an IS artefact, and also that it is unique and innovative, we adopt Design Science Research (DSR) as research paradigm (Hevner et al., 2004), which results in the following research steps: 1) build a **model representing statements of claim as visual stories**; 2) build a **template to generate statements of claim** as visual stories; 3) build a procedure to **analyze the coherence of statements of claim**; and 4) **experimentally evaluate the method** using the abovementioned model, template and procedure. This research contributes to explore the adoption of visual stories in judicial systems. From a theoretical perspective, it contributes to extend visual narrative theory to the judicial context. It also addresses the problem of the quality of information exchange in self-help judicial systems.

In the next section, we discuss the research methodology. Then, we discuss the theoretical foundations. In sections 4 and 5 we discuss and evaluate the method. We conclude the paper with some points for discussion and future research.

2 Research Methodology

Perimeter of research. In the origin of a judicial process in the civil domain, we can find a conflict. The contradictory positions taken by those involved in the conflict determine that one of them decides to resort to the court to resolve it. In general, civil processes are organized in pleadings, sanitation, instruction, judgment, and sentence. In the first stage, the plaintiff submits a statement of claim to the court, which is followed by a statement of defense submitted by the defendant. In the sanitation stage, the plead is evaluated and condensed by a judge. If the process moves to the instruction stage, the parties present evidence intended to prove the veracity of facts and arguments. In the judgment stage, the court decides which facts are considered proven. Finally, the court decides and delivers the sentence. This generic description helps understanding the complexity of the research context.

In this research, we are only interested in the first stage: construction of statements of claim by plaintiffs. Implicit in our research is a scenario where the plaintiff is a single person facing a conflict with a big company. Considering convenience and cost, the plaintiff would like to be self-represented. However, the plaintiff faces the problem of submitting a coherent statement of claim. The different capacities of the plaintiff and defendant in this scenario justify that our study is restricted to the statement of claim. Even though it is a small part of a complex process, it is critical regarding the quality of information exchange: if the claim contains inadequacies or inaccuracies, the court may consider it handicapped and, worst-case scenario, may immediately close the process. If the claim is not handicapped but has low quality, that may influence the process in favor of the defendant. Therefore, it is vital for plaintiffs to submit good quality statements of claim.

Research approach. DSR concerns the design of innovative IS artifacts (Hevner et al., 2004). By artifact we mean anything that is human made and has either a material (e.g. software tools) or abstract nature (e.g. models, methods and procedures) (Gregor, 2006). This research is centered on method design. However, the method is a combination of other artefacts: model, template and procedure. The iterative realization of model, template and procedure provides a rational and transparent pathway for understanding the method design.

DSR is framed by two principles (Gregor & Jones, 2007; Hevner et al., 2004): rigor using existing and generating new knowledge; and relevance to the wider research/practice environment in the form of utility solving relevant problems. Considering rigor, all designed artifacts are based on kernel theory providing justificatory knowledge for artifact construction (Gregor & Jones, 2007). Adopted as kernel theory, we consider narrative theory (Labov, 1972, 1997), visual narrative theory (Cohn, 2013, 2014; Cohn et al., 2012) and judicial narrative (Bex, 2011). These theoretical foundations rigorously bound the artifacts to existing knowledge. Regarding relevance, we note the design concerns a generalized problem (quality of information exchange), which clearly pertains to the IS field. Then, the research

delivers a relevant design solution. In particular, we support the adoption of self-help, which is a current challenge for innovating judicial systems (Goh, 2018). Finally, the utility of the design solution is demonstrated through experimentation, which suggests the solution is viable in solving the problem.

3 Theoretical Foundations

A judicial process always materializes from a particular situation involving events and facts. As the facts are unable to speak for themselves and often cannot be independently observed (as in a laboratory experiment), the narrative reconstruction of events to determine the facts is a necessary and defining constituent of a judicial process (Bex, 2011). Therefore, narrative is present in every judicial system. *Judicial narrative* can then be defined as a description of events and properties of a situation of legal importance (Almog, 2001; Schmid, 2010).

The construction of judicial narrative is based on stories submitted by the parties (Pennington & Hastie, 1992). Stories combine narrative with intent (Schmid, 2010). A *story* is a delimited, coherent and chronologically planned sequence of events, mingled with contextual details highlighting the nature and importance of events. Stories also involve discourse, which is the way in which the story is presented using a language and a medium (e.g. text, speech, pictures, and animations).

A *visual story* is a particular form of story, using specific language and medium. Visual stories rely on pictures with symbols, icons, shapes, text, and figures to convey meaning. Visual stories can be powerful vehicles for the transmission and processing of events. Especially in low literacy communities, pictures may have an important role illustrating, clarifying, simplifying, and reinforcing words. Visual stories make the subject and intentions of the message more understandable and therefore significantly strengthen the communicative effect (Boehme-Neßler, 2011; Kodagoda et al., 2012; Medhi et al., 2010). For instance, the visual narratives created by the National Truth Commissions in Guatemala (Guatemala, 2000) to explain national violence are a compelling example that underlines the importance of explaining complex events in simple, clear and effective ways.

However, introducing visual stories in judicial systems is a complex endeavor. We take a stepwise approach to discuss the role of visual stories in judicial systems. We start by analyzing the concept of story in more detail.

3.1 Stories and factual stories

Narrative structure is implicit in the concept of story. *Narrative structure* is the organization of events, links between events, and associated contextual information (Crossley, 2002; Labov, 1972; Sarbin, 1986). Links can be causal, temporal or spatial. Thoughts, memories and ideas help contextualizing the events and contribute to understand the movement of characters and events in time and space (Jannidis, 2003). The development of narrative structure is commonly referred to as holistic (Bex, 2011). It is the whole that determines the meaning of the different parts. In a judicial process, it is necessary to present the facts, but this alone is not enough. An overall narrative structure is necessary to bind facts to events and context. Sarbin (1986) points out that narrative structure brings logic to a set of events. Appan et al. (2004) note that narrative structure helps reconstructing the events even when the story is incomplete and unstructured, but from which the logical relationships can be identified and clarified.

Related to narrative structure, we find the notion of plot. The *plot* is the way of presenting events according to a style (Abbot, 2007). Examples include presenting a story from begin to end, end to begin, or using flashbacks. A story is held together by the plot (Ricoeur, 1991). Quesenbery and Brooks (2010) note the plot helps the author to tell the story, helps the audience understanding the story, and helps the story itself, to stand out as an intelligible account of the events. By controlling the plot, the narrator can help internalizing the story, thus increasing its effectiveness (Quesenbery & Brooks, 2010).

Above narrative structure and plot, we consider *meta-structure*, which defines the overall framework on which the narrator defines the plot. Meta-structure allows the plot to be more easily recognizable. Even

though the narrator has freedom to define a plot, care should be taken to create a recognizable plot on which to lay out the story. In particular, judicial processes depend on a specific meta-structure, which concerns *factual stories*: the telling of events and other supporting information with the purpose to identify the facts. A factual story is usually oriented towards temporal order, which contributes to determine temporal causality (Amsterdam & Bruner, 2002). Labov (1972) suggested a specific meta-structure for factual stories, which consists of five consecutive elements (brackets indicate an element is optional):

Factual story = Orientation + Complication + Evaluation + Resolution + [Coda]

Orientation refers to the introductory part of the story. Factual stories always start with essential information about the participants, setting, place, and temporal frame. The second element is *complication*. The complication is an essential element of judicial narrative where the author describes a set of events in an evolving conflict. The next element is *evaluation*. For Labov and Waletzky (1966), factual stories involve points of personal interest, which are expressed in the evaluation. A plot that does not have evaluation does not indicate the relative importance of the events and may not be effective. Another element found in factual stories is *resolution*. The resolution answers the problem posed by the complication. The evaluation and resolution can be merged into one single element (Labov, 1972). Finally, factual stories may have an optional element called *coda*, which signals that the story reached a close from the narrator's side (McCormack, 2004).

Even though this meta-structure constrains the story, the narrator is nevertheless allowed to develop different plots. In particular, plots may be enriched with frames, prescriptions and interludes (Quesenbery & Brooks, 2010). A *frame* is a sub-plot within a plot. The sub-plot does not change the underlying narrative but creates a small story arc that moves out from the narrative and then comes back to the same point. Sub-plots may be used to narrate what happens to characters (me-them-me), what happens spatially (here-there-here), and what happens temporally (now-then-now). A *prescription* is used to convey a causal explanation, which may be essential to deduce a fact. Quesenbery and Brooks (2010) define a prescription using the following construct: "given [a context] and [some more context], when [an event], then [an outcome] and [another result]". Finally, an *interlude*, or break in the narrative, enriches a story with contextual details, e.g. about places, time, culture, and geography.

3.2 Visual stories

The concepts of story and factual story apply to any type of story, including visual stories. It just happens that visual stories use pictures instead of text. By pictures we mean a set of elements that must be understood through visual cognition, i.e. scanning shapes, symbols and characters (Goel, 1995). In fact, pictures may include both visual and textual elements (Cohn et al., 2012). Multiple pictures may have to be arranged to convey a visual story. As an example, a set of pictures may convey information about a car accident, the location of intervening cars, and details about the intersection where the accident occurred. The visual story may then use several pictures to tell how the car accident enfolded and where it happened, showing e.g. a pedestrian crossing the road, then one vehicle trying to stop, and another vehicle colliding with a motorcycle.

Visual stories also have narrative structure and plot. In the car accident example, while several pictures narrate the events and the context in which the events occurred, the plot commands such information in a particular way (Cohn, 2013). Sarbin (1986) says that, if people are presented with a set of pictures, then they will try to combine them according to a known plot to build a story. The plot may be either implicit or explicit in the visual story and depends on the knowledge and experience of readers (Cecez-Kecmanovic, 2005).

Visual stories should also have a meta-structure, which helps understanding the plot. Cohn (2013) proposed a meta-structure consisting of five consecutive elements (brackets indicate an element is optional):

Visual story = [Establisher] + [Initial [+ Prolongation]] + Peak + [Release]

Establisher is the element that establishes the action, without acting on it, while *Initial* is the element that initiates the action, and *prolongation* extends the action according to a certain narrative arc. The *peak* is the picture that marks the highest point of tension in the narrative (Cohn, 2013). Finally, *release* is the element that releases the tension of the narrative. According to Cohn (2014), peak is the most important and only essential element of a visual story, which tells the most important things that happened.

3.3 Coherence of factual stories

Stories in the judicial context need to be coherent, a concept referring to the way in which the elements intervening in a story bind to each other to give sense to the narrative (Bex, 2011; Wintgens, 2005). However, coherence is an umbrella term for more specific properties such as completeness, consistency and credibility (Pennington & Hastie, 1992). Completeness assesses whether a story contains all necessary elements, while consistency evaluates the existence of contradictions and credibility assesses whether the narrative is realistic. Wintgens (2005) notes that consistency is not a necessary condition for coherence; it is however a disabling property.

In the assessment of facts by a court, credibility can be checked by analyzing both the internal and external narrative elements linking the story to the narrator and the socio-cultural reality (Arnauld & Martini, 2015). Labov (1997) also noted that credibility is the extent to which the listeners believe that the described events occurred as reported by the narrator. Placed in an area between the internal and the external, the completeness of the description of a set of events also affects the credibility of a story (Arnauld & Martini, 2015).

Additional properties of coherence can also be considered, such as temporal, causal, spatial, referential, and thematic (Gernsbacher, 1991; Habermas & Bluck, 2000). Temporal coherence refers to consistency in identifying the moments in which events occurred, while causal coherence refers to consistency in the prescriptions suggesting explanations for a chain of events, spatial coherence refers to consistency in identifying the places where the events occurred, referential coherence refers to the consistency about whom or what is described, and finally, thematic coherence concerns the organization of a story around a central theme.

Considering the connections between all these properties, we suggest that meta-structure promotes completeness and consistency through logical sequencing (in time and space), causal reasoning (in the chain of events), and consideration for all elements required by judicial narrative.

4 Artefact Development

Model representing statements of claim as visual stories. We propose a model for representing statements of claim which combines propositions from judicial narrative and visual narrative (Figure 1). We take the view that meta-structure fosters coherent visual stories and therefore adopt elements proposed by Labov (1972) and (Cohn, 2013) to define the model. A story starts by identifying the parties (plaintiff and defendant) and objects (e.g. a product or a service) involved in the judicial process. We designate this element as "constituents". This element does not start the narration of the conflict; it just reflects the assumption that a coherent factual story should describe who enters the action before describing the action.

We then consider an element describing what initiates the conflict: the "initiation". We consider two alternative plots accomplishing this goal. The first plot describes one or more events that ignited the conflict. Alternatively, the second plot describes the situation that ignited the conflict. These two alternatives reflect different ways of starting a factual story.

Then we move the story to the most extensive part, which we name "evolution". The evolution element uses various pictures to describe what happened with significant detail and contextual information. However, from the previous discussion, we also understand that factual stories need to be enriched with

narrative elements beyond the sequence of events. For that reason, we consider the inclusion of multiple frames, interludes and prescriptions.

We then consider one single picture appearing after the evolution phase and singling out a particular event as the peak of the factual story. In a statement of claim, it corresponds to the point where the plaintiff explicitly identifies the conflict.
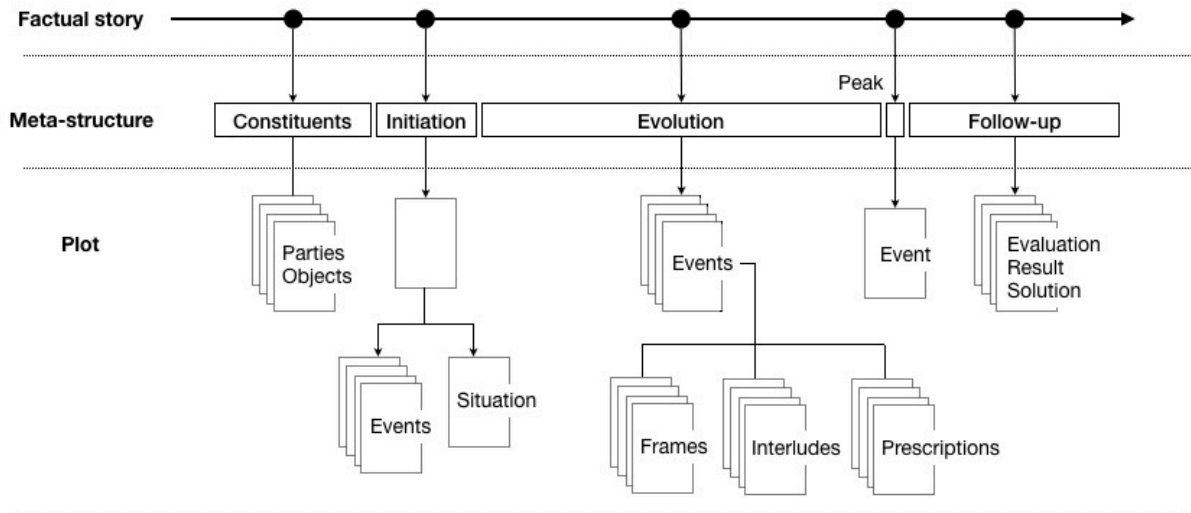

Figure 1.   Model representing statements of claim as visual stories

We finally consider that a factual story may end with a component combining evaluation and resolution. This element is set as a follow-up to the peak. Regarding the statement of claim, the follow-up may combine three types of information: 1) evaluation, expressing a final opinion about the conflict; 2) result, identifying the consequences of the conflict; and 3) solution, stating how the plaintiff would like the conflict to be resolved.
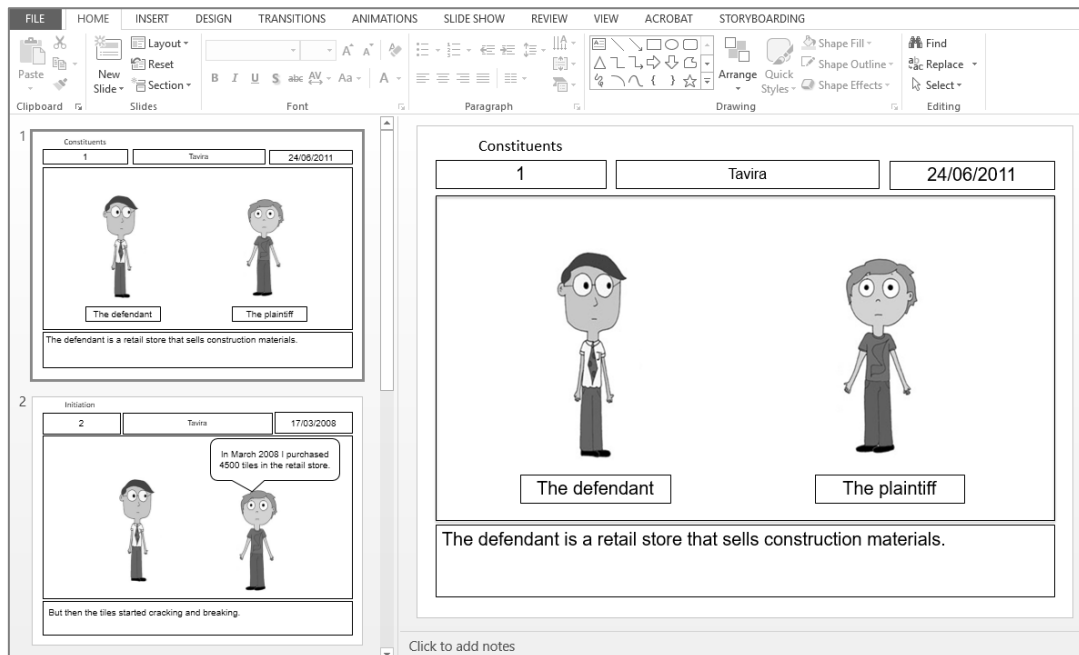

Figure 2.   Template for creating statements of claim as visual stories

Template for creating statements of claim as visual stories. We are aware of many tools that can be used to create generic visual stories, such as Witty Comics, Strip Generator, Make Beliefs, Write Comics, Chogger, Cartoon Story Maker, and ComicStripCreator. However, none specifically facilitates the creation of statements of claim. To accomplish our specific goals, we created a template in Microsoft's PowerPoint, which is illustrated in Figure 2. The template makes the proposed model explicit to the users by defining placeholders for inserting the constituents, initiation, evolution, peak, and follow-up of a conflict. The template also contains generic pictures showing typical commercial events such as buying a product, paying a product, discussing with the seller, etc., which can be used to compose the story. Pictures show either one or two characters, which can represent both the plaintiff and the defendant. The characters are shown along with labels and dialogue bubbles. The labels are used to provide references to time, space and the character's identities. The dialogue bubbles can then be used to put words in the character's mouths. Most pictures also have larger text fields used to narrate the portrayed events in more detail. The visual elements shown in pictures were taken from publicly available artwork, e.g. a house, a container, a plant or a court image.

The template does not require the narrator to draw a story. Instead, a story is composed by picking pictures from the library, placing them in a placeholder provided by the template, and then configuring labels, dialogue bubbles and text fields.

Coherence	Elements	Questions
Mandatory elements	Mandatory elements = constituents, initiation, evolution, peak, follow-up	Has the statement of claim all mandatory elements?
Element types	Constituents = parties AND objects Initiation = events XOR situation Evolution = events, frames, interludes, prescriptions Peak = event Follow-up = evaluation, result, solution	Each element in the statement of claim has the required type?
Order of elements	Order = constituents → initiation → evolution → peak → follow-up Evolution = events, frames, interludes, prescriptions	Each element is defined in the required order? Frames, interludes and prescriptions are defined within the evolution element?

Table 1.   Analytical procedure for analyzing structural coherence

Procedure for analyzing statements of claim. We now define a procedure to check the coherence of statements of claim. This procedure is an important part of our research and is necessary to evaluate the experimental data. We divide the procedure in two phases considering structural analysis and substantive analysis. In the first phase, we check if a statement of claim complies with the model (Table 1) by looking at the form without considering the actual content. The model defines some mandatory elements, such as the constituents, initiation, evolution, peak, and follow-up. If any mandatory element is missing, then the statement of claim cannot be considered coherent. The model also defines element types. For instance, the initiation must contain either events or a situation. If any element does not conform to the defined types, then the statement of claim is not coherent. Finally, we also check the order of elements. If the order does not adhere to the model, the statement of claim is not coherent.

Structural analysis provides a useful and meaningful assessment of the statement of claim, which nevertheless must be followed by an analysis of the substance of the claim. Therefore, in the second phase, we focus on the substance of the pictures provided in the statement of claim. This involves checking the details, i.e. what dialogues are expressed by the characters, how they relate to time and space, and how they relate to contextual information provided in text fields. To structure this analysis, we consider the requirements suggested by Gernsbacher (1991), Pennington and Hastie (1992) and Habermas and Bluck (2000). The procedure is summarized in Table 2.

Coherence criteria	Elements	Requirements	Questions
Temporal	Initiation, evolution, peak	Events must be temporally annotated Events must be presented according to temporal order	Are all events temporally annotated? Is it possible to understand which event follows a given event?
Spatial	Initiation, evolution, peak	Events must be spatially annotated Events must be related to reported places	Are all events spatially annotated? Is it possible to understand which place follows a given place?
Causal	Initiation, evolution, peak	Follow-up must be causally related to peak Prescriptions must have cause-effect links to events	Is peak related to initiation? Is follow-up related to peak? Are prescriptions, if any, related to events?
Thematic	All	Elements must refer to a central theme	Is the set of events referring to the initiation?
Completeness	All	Elements must provide all necessary elements to understand the conflict	Is the set of events complete sufficient to understand the conflict? Does the evolution provide enough contextual information?
Consistency	All	Elements must not provide any internal contradictions	Are there any contradictions among events?
Credibility	All	Elements must fit the sociocultural reality	Is the information in elements feasible?

Table 2.   Analytical procedure for analyzing substantive coherence

5   Evaluation

To evaluate the method, a research question is formulated: Considering the context where plaintiffs do not have specific knowledge about judicial processes, can they create coherent statements of claim in the form of visual stories?

For the evaluation, we formulate the equation $R = f(P, C, M)$ where R is the result of applying the procedure for analysing a statement of claim; P is a participant; C is the case describing a conflict; and M is the method used to create a statement of claim. To assess R, we control P and C, and use M and R as independent and dependent variables, respectively.

Two cases of legal conflict between citizens and companies were selected (C_1, C_2). The cases describe real claims taken from sentences published by courts of first instance. Relevant elements from the sentences were identified and transposed to construct descriptions of conflicts from the plaintiffs' perspectives. These descriptions were sufficiently detailed to allow the participants to elaborate a coherent statement of claim. However, three different narratives of the events were developed for each case: C(o) written narrative of events in chronological order; C(u) unordered written narrative of the events; and C(v) video narrating the events in chronological order. The purpose of C(o) and C(u) is to moderate effects caused by how the narrative structure of the cases presented to the participants in the experiment affects the experimental results.

Method comparison. The creation of statements of claim involved two methods: written (M_w); and visual (M_v). M_w is the baseline for comparative evaluation, as it corresponds to the typical case where a self-represented plaintiff submits a written statement of claim to the court. M_v is the treatment we seek to evaluate, as it corresponds to the case where a self-represented plaintiff creates a statement of claim as a visual story, using the proposed method.

For M_v, we used the template for creating statements of claim as visual stories (Figure 2). For M_w, we had to define a way for creating written statements of claim, which could be compared to the developed template. The adopted approach is a textual template which presents the users with the following sections: introduction, narrative, and conclusion. This structure follows the structure we commonly find in written statements of claim.

Operationalization of experiments. The evaluation involved four sets of participants (P_{1-4}) and four experiments (E_{1-4}). The participants consisted of twenty people between 19 and 54 years old, either graduated or pursuing undergraduate studies, selected by direct contact. The participants had to comply with two constraints: not having specific knowledge about judicial processes; and knowledgeable about Microsoft's PowerPoint.

In E_1, P_1 members were asked to create visual claims for case 1 ($P_1,C_1(o),M_v$), and P_2 were asked to create written claims for the same case ($P_2,C_1(o),M_w$). In this experiment, the first treatment represents the plaintiff who, to resolve a conflict, appeals to the court using a visual statement of claim and the second treatment represents the plaintiff who appeals to the court using a written claim. For E_2, to minimize any learning effects, a different case was used and P_1 and P_2 were asked to create claims using the alternative treatment ($P_1,C_2(o),M_w$) and ($P_2,C_2(o),M_v$). In E_3, a different group of participants created written and visual claims from cases narrated with video ($P_3,C_1(v),M_w$) and ($P_3,C_2(v),M_v$). Finally, in E_4 another group of participants created written and visual claims from unordered textually narrated cases ($P_4,C_1(u),M_w$) and ($P_4,C_2(u),M_v$).

Each experiment started by showing the participants an example case (C_3) and a coherent statement of claim about the case in the form required by the experiment (either written or visual). Then the participants were asked to create a similar output for the assigned case. No further instructions were provided.

Data processing. The procedure for analyzing statements of claim was used to assess the data. To translate the results into quantities, two indicators were defined: 1) A_c, average coherence of a structural element in the statement of claim; and 2) A_w, average coherence of the whole statement of claim. A_c is calculated in two steps. In the first step, for a particular structural element, we assess all possible coherence criteria shown in Tables 1 and 2. In the second step, we average all the coherence measures for the structural element under consideration. Each coherence check returns a value that is either 0 (not coherent) or 1 (coherent).

To illustrate, when evaluating the temporal coherence of a statement of claim narrated as a visual story, each picture belonging to the initiation, evolution and peak must be analyzed. If in these elements it is verified that all dates are well defined and that from these dates it is possible to understand the temporal sequence of events, then 1 is assigned to these three elements, regarding temporal coherence. Of course, the pictures in the statement of claim must also be assessed regarding the spatial, causal, thematic, and other properties.

Table 3 summarizes the results for A_w in the various treatments. The results for A_c are not shown for conciseness. These results show that the participants created more coherent visual claims than coherent textual claims. These are aggregate results considering both structural and substantive coherence. However, we note that the differences between treatments result from substantive coherence: 80% visual claims were not coherent in a substantive way, while 50% textual claims were either not complete or consistent in a substantive way.

To illustrate the summary provided in Table 3, in the evaluation of the visual claim from participant 16, it was identified that, in the initiation and evolution elements, an essential event for understanding the conflict was missing. Therefore, the statement of claim had no temporal, no spatial and no causal coherence, was incomplete, was not consistent, and was not credible. In this claim, each of the six specific coherence properties was left with a value of 0 for initiation and evolution elements. Considering the set of elements on which the six properties applies (Table 2), this claim had: $A_c = 33\%$ for temporal, spatial and causal coherence; $A_c = 60\%$ for completeness, consistency and credibility; $A_c = 100\%$ for thematic coherence; and the overall coherence was $A_w = 52\%$.

Analysis of results. The experimental results show that plaintiffs may indeed be able to create coherent statements of claim – both using written and visual claims. However, the participants created a higher number of coherent visual claims than coherent written claims. These results suggest the method promotes the quality of information exchanged between self-represented citizens and judicial systems.

We carried out statistical tests to determine if the experimental results from the two samples (M_w and M_v) were statistically different. First, normality tests were performed using the Shapiro-Wilk test. With a probability of error of 5%, it was concluded that the sample distributions were not normal. Then, the samples were analyzed using the Wilcoxon matched-pairs (Wilcoxon signed-ranks test) nonparametric test. In the interpretation of the test results a significance level of $\alpha = 0.05$ was used. For the conditions specified, the Wilcoxon test statistic is $W = 6$ and the critical value is $W* = 10$. In this case, as $W < W*$, the result led to the rejection of the null hypothesis. Thus, statistically, there is sufficient evidence to state that, on average, visual claims are more coherent that written claims.

Exp. (E)	Part. (P)	Coherence of visual claims (M_v)				Coherence of textual claims (M_t)			
		Case	Structural	Substantive	A_W (%)	Case	Structural	Substantive	A_W (%)
E₁, E₂	1	C₁	1	1	100	C₂	1	1	100
	2		1	1	100		1	0	88
	3		1	1	100		1	0	88
	4		1	0	76		1	0	88
	5		1	0	88		1	1	100
	6	C₂	1	1	100	C₁	1	1	100
	7		1	1	100		1	1	100
	8		1	1	100		1	1	100
	9		1	0	88		1	0	88
	10		1	1	100		1	0	84
E₃	11	C₁	1	1	100	C₂	1	1	100
	12		1	1	100		1	0	68
	13		1	1	100		1	0	76
	14		1	1	100		1	1	100
	15		1	1	100		1	0	88
E₄	16	C₁	1	0	52	C₂	1	0	28
	17		1	1	100		1	1	100
	18		1	1	100		1	0	16
	19		1	1	100		1	1	100
	20		1	1	100		1	1	100
			100.0%	80.0%	95		100%	50.0%	86

Table 3.   Experimental results (1 means the claim is coherent, while 0 means it is not)

We also evaluated if there were significant statistical differences between the number of coherent visual claims and the number of coherent written claims. For the two samples, normality tests were performed using the Shapiro-Wilk test. With a probability of error of 5%, it was concluded that in the two samples the distribution is not normal. Thus, the analysis used the Wilcoxon nonparametric test for paired data. For the conditions specified, the Wilcoxon test statistic is $W = 4.5$ and the critical value is $W* = 5$. In this case, as $W < W*$, the result led to the rejection of the null hypothesis. Therefore, with a 5% error probability, we can statistically infer that the number of coherent visual claims was higher than the number of coherent written claims.

Due to the nature of judicial processes, it is important that statements of claim are coherent. Therefore, these results provide preliminary empirical evidence that, for plaintiffs lacking technical knowledge necessary to create a coherent statement of claim, visual narrative can facilitate the creation of a coherent description of events. The results also support the claim that participants using a visual method perform better than using a textual method for generating a statement of claim.

Looking into the results with more detail, we note that structural coherence was similar in both visual and textual claims. These results may be related to the way we operationalized the experiments, using in both treatments templates that foster users to provide all structural elements required by a statement of claim. Differences between visual and textual claims therefore result from substantive coherence, where the template for creating statements of claim as visual stories seems to provide an advantage. Since the template makes the temporal and logical relationships between the elements of a statement of claim more explicit to users, we suggest that the observed differences may in fact be attributed to the added value provided by the proposed model.

6   Discussion and Conclusions

The adoption of visual narrative in the judicial domain has not been previously researched. This study provides a first step in this research area, which is necessarily delimited in scope and exploratory in nature. However, we focus on a problem that is very relevant for the IS field, which concerns the quality of information exchanged between self-represented citizens and judicial systems. Contributions in this area may have significant impact in society, as self-representation and self-help may contribute to expedite processes, reduce costs, and increase convenience, accessibility, fairness, and openness.

Our contribution is a method supporting the creation of statements of claim by self-represented plaintiffs. The uniqueness of this method is adopting visual narrative theory to create *visual* stories. Furthermore, the method supports the creation of *coherent* stories. The method includes a model and a template. The model defines the meta-structure of visual stories in the judicial domain. The template then supports the creation of statements of claim with model support (self-help). The model extends narrative theory and visual narrative theory to the particularities of the judicial context. Regarding coherence, we address this challenging requirement from multiple dimensions, including temporal, spatial, causal, thematic, credibility, consistency, and completeness.

The juxtaposition of coherence and narrative structure, one orienting another, is essential to our approach to the problem of quality of information exchange. Considering the close relationships between narrative structure and coherence, the proposed model articulates a set of structural elements and types of relationships from which the narrator can build a coherent statement of claim. On the one hand, narrative structure supports the creation of stories conforming to well-known referential schemes used in judicial narrative. On the other hand, the adoption of common principles of coherence facilitates the construction and analysis of statements of claim, which in turn contribute to avoid certain deficiencies, inaccuracies and ambiguities in portrayed events, and which ultimately contribute to judicial narrative.

Considering the ambitious, albeit exploratory, nature of this research, the challenges and problems validating it were considerable. To evaluate the method, we had to develop a detailed and systematic procedure for checking the coherence of statements of claim. Then, we had to devise and implement a set of controlled experiments. Finally, we had to devise a strategy and appropriate measures for comparing the method against a baseline.

The empirical results provide some evidence that the method supports the creation of coherent statements of claim; and also provide some evidence that using the method can give better results than simply writing a statement of claim.

In a broader perspective, we note our results not only foster the adoption of self-help in judicial systems but also suggest several opportunities for digital institutionalization in the judicial environment. For instance, we envisage the method integration as a service in online judicial platforms, which may then

support and oversee the construction of statements of claim. Our strict separation between method, template and tool allows the method to be integrated with different templates and tools and using different levels of technological support in the construction of individual stories. We also envisage the method being provided by independent organizations supporting citizens with difficulties accessing the law. Even if such organizations face financial constraints in developing and maintaining complex judicial services, the proposed method offers a low-cost alternative to self-help support, which may consist in just offering a collection of templates for the most frequent claims.

This study also opens several avenues for future research. Firstly, by providing a discussion of preliminary evidence and existing limitations, the study offers a foundation for more thorough experimentation with visual stories in the judicial domain. In particular, we consider strengthening the evaluation by conducting further experiments with more controlled conditions, e.g. regarding differences between visual and textual construction of statements of claim, and potential impact of templates in the results. We also consider conducting experiments with incomplete narratives, as omissions may also affect the results. Future research should also consider combining the assessment of coherence with other evaluative dimensions, such as understandability (for citizens) and utility (for citizens and courts).

Secondly, future experiments may consider comparing self-representation/self-help with the more traditional approach to communicating with the court through legal experts. Another avenue to consider arises from the combination of the proposed method with decision support systems. Currently, the template used to create statements of claim is based on a common presentation tool. If instead based on a decision support system, the template may offer additional functionality, in particular self-assessment of the coherence of statements of claim. A validated model for judicial narrative also provides a fundamental trigger for the development of other computer-based tools that could help users to better understand judicial processes.

Finally, future research may also explore the adoption of visual stories in other stages of the judicial process requiring communication with the court, which may also consider bi-directional communication. As noted earlier, such communication is critically dependent on the quality of the information that is exchanged between the different stakeholders, and this research provides a contribution to address this relevant problem.

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