



Humanoid robots for contract visualisation

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ABSTRACT: This paper challenges two assumptions made by most lawyers: first, that contracts should consist of words alone; second, that only human beings are capable of designing the “look and feel” of contracts. These assumptions amount to taboos – even in today’s digital world. Humanoid robots for contract visualisation would or rather will break these taboos. Contract visualisation constitutes a fledgling subject concerning various fields of law (e.g. visual law, legal design, contract law, legal theory and EU law). This topic needs to be explored from different perspectives. Although humanoid robots are being increasingly implemented in the legal context, their potential for contract visualisation has not yet been investigated. This paper therefore discusses contract visualisation and how humanoid robots might use visuals of the Contract Design Pattern Library presented by the International Association for Contract & Commercial Management (IACCM). The findings prompt discussion about whether and, if so, how to communicate legally with those anthropomorphic machines. Or even more specifically, about whether and, if so, how humanoid robots might best represent contracts visually and communicate these both to humans and to other humanoid robots.

KEYWORDS: visual law – contract law – EU law – legal theory – robot-based contract visualisation – legal design.

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I. Introduction

1. Impacts of digital media on law

1.1. Doctrinal and non-doctrinal perspective on these impacts

How do digital media affect law and legal practice? “*The answer to this question has taken a wide variety of forms in an outpouring of scholarship*”.¹ This scholarship has been discussing various legal-doctrinal questions, such as “*how the special properties of electronic media will invite improvement or will require adjustment in particular bodies of law, [...]*”.² Moreover, “*not a field of law but cyberspace itself [...]*”³ has prompted reflection on how to regulate the universe of computer networks, particularly the Internet. Considering this ongoing discussion, some scholars are also forecasting on how the new information and communication technologies will impact law and legal practice.⁴

Only a few legal scholars, however, “*have engaged in a more broad-reaching and ambitious form of prediction*”.⁵ They stress “*the fundamental importance of an age’s dominant form of communications media in shaping not just particular doctrines and institutions, but the overall tenor of a legal culture*”.⁶ These actors describe how culture and thus law has evolved from an oral era to a written (print) and eventually a digital era.⁷ For instance, Collins, Skover and Katsh have observed that “*the coming age of electronic media will rework law as profoundly as the printing press once did*”.⁸

1.2. Digital contracting and digital contracts

In 1995, Katsh explored “*opportunities presented by the new media for structuring relationships*”.⁹ By “*new media*,” he meant *digital* or *electronic* media. He had in mind especially contractual relationships and studied how digital media might serve contracting and contracts.¹⁰ “*First, the consumer marketplace has produced software that allows lay people to produce some contracts without the aid of a lawyer*”.¹¹ Second, lawyers might use “*document-assembly or document-drafting programs [...] to put together more complex contracts*”.¹² In both cases, such software-created contracts were printable.¹³ Third, moving “*beyond the electronically generated paper contract*,” Katsh envisioned “*contracts that exist only in cyberspace and that also cannot really be duplicated on paper*”.¹⁴ Such digital-only contracts “*are interactive and dynamic*”.¹⁵

Since 1995, almost a quarter of a century has passed and technology has been developing smart contracts.¹⁶ Teubner has recently called this development “*a*

¹ Richard J. Ross, “Communications Revolutions and Legal Culture: An Elusive Relationship,” *Law & Social Inquiry* 27, issue 3 (July 2002): 637.

² Ross, “Communications Revolutions and Legal Culture,” 637.

³ Ross, “Communications Revolutions and Legal Culture,” 638.

⁴ See Ross, “Communications Revolutions and Legal Culture,” 638.

⁵ Ross, “Communications Revolutions and Legal Culture,” 638.

⁶ Ross, “Communications Revolutions and Legal Culture,” 638.

⁷ See Ross, “Communications Revolutions and Legal Culture,” 638.

⁸ Ross, “Communications Revolutions and Legal Culture,” 638.

⁹ M. Ethan Katsh, *Law in a Digital World* (New York: Oxford University Press, 1995), 115.

¹⁰ See Katsh, *Law in a Digital World*, 114–32.

¹¹ Katsh, *Law in a Digital World*, 117.

¹² Katsh, *Law in a Digital World*, 117.

¹³ See Katsh, *Law in a Digital World*, 117–18.

¹⁴ Katsh, *Law in a Digital World*, 118.

¹⁵ Katsh, *Law in a Digital World*, 118.

¹⁶ On smart contracts, see, e.g., Harry Surden, “Computable Contracts,” *UC Davis Law Review* 46, No. 2

revolution,” in that “people delegate the task of negotiating and executing contracts to algorithms”.¹⁷ Section 14.1 of The Uniform Electronic Transactions Act (UETA), introduced by the National Conference of Commissioners on Uniform State Laws (NCCUSL), discusses automated transactions: “A contract may be formed by the interaction of electronic agents of the parties, even if no individual was aware of or reviewed the electronic agents’ actions or the resulting terms and agreements”¹⁸. Besides this US-American provision, Article 21 of the Canadian Uniform Electronic Commerce Act (1999) stipulates that electronic agents may conclude contracts.¹⁹

1.3. Visual and audio-visual digital contracts

In 1992, Collins and Skover deplored the fact that “our legal consciousness is still demarcated and mediated by printed texts. Whether, for example, in the formation and interpretation of wills or contracts, [...], the law’s primary instrument remains the printed document”.²⁰ The authors, however, added: “But that reality is changing. We live in an era of ‘paratexts,’ in which words and images, as captured by electronic recording, compete with print to represent legally significant events”.²¹ In that regard, they observed that video cameras, for instance, record negotiations²² or contracting and contracts.²³ In their understanding, a paratext is an audio-visual, “hybrid medium that is in varying degrees oral, pictographic, and typographic”.²⁴

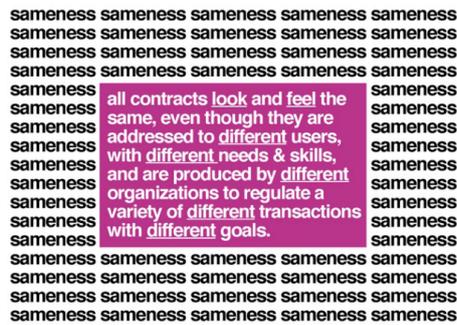


Figure 1: Stefania Passera, Sameness²⁵

(December, 2012); Christopher D. Clack, Vikram Bakshi, and Lee Braine, “Smart Contract Templates: foundations, design landscape and research directions,” *arXiv:1608.00771* (August 2, 2016, last revised March 15, 2017); James Hazard and Helena Haapio, “Wise contracts: smart contracts that work for people and machines,” in *Trends and Communities of Legal Informatics IRIS 2017: Proceedings of the 20th International Legal Informatics Symposium*, eds. Erich Schweighofer, Franz Kummer, Walter Hötzendorfer, and Christoph Sorge (Vienna: Österreichische Computergesellschaft, 2017); Kevin Werbach and Nicolas Cornell, “Contracts ex Machina,” *Duke Law Journal* 67 (2017).

¹⁷ Gunther Teubner, “Digital Personhood? The Status of Autonomous Software Agents in Private Law,” trans. Jacob Watson, *Ancilla Iuris* (May 30, 2018): 58.

¹⁸ Uniform Law Commission, “Electronic Transactions Act,” ULC Uniform Law Commission, ULC Uniform Law Commission, accessed 10 December 2019, <https://www.uniformlaws.org/committees/community-home/librarydocuments?communitykey=2c04b76c-2b7d-4399-977e-d5876ba7e034&tab=librarydocuments>.

¹⁹ Uniform Law Conference of Canada, “Uniform Electronic Commerce Act,” ULCC Uniform Law Conference Canada, ULCC Uniform Law Conference of Canada, accessed 10 December 2019, <https://www.ulcc.ca/en/1999-winnipeg-mb/359-civil-section-documents/1138-1999-electronic-commerce-act-annotated>.

²⁰ Ronald K.L. Collins and David M. Skover, “Paratexts,” *Stanford Law Review* 44, No. 3 (February 1992): 509–10.

²¹ Collins and Skover, “Paratexts,” 510; my emphasis.

²² See Collins and Skover, “Paratexts,” 535.

²³ See Collins and Skover, “Paratexts,” 510.

²⁴ Collins and Skover, “Paratexts,” 536.

²⁵ © 2018 Stefania Passera. Used with permission. Source: Stefania Passera, “Bringing Legal Design

Inspired by Collins and Skover, three years later Katsh observed: “*underlying the following discussion of contracts is the larger question of how we continue to relate to other kinds of paper documents and print resources on which the law now places so much faith. We interact with information on paper so routinely that little if any thought has been given to what it will mean when the words of the law, and perhaps the pictures and sounds of the law, become accessible using a mode of communication that involves a very different kind of interaction from what we have had in printed form.*”²⁶

Elsewhere, he states: “*The varied possible uses of visual communication mean that different facets of the law will likely employ the visual in different ways*”.²⁷ Beyond visual legal persuasion, “[t]he visual media present us with new opportunities for recording legal events”.²⁸ Like Collins and Skover, Katsh considers contracts, deeds and records of transactions to be such legal events.²⁹ In his view, it is possible to visually record contracts. By “*visually*,” he means “*audio-visually*” as he also mentions the possibility of videotaping legal events (e.g. contracts). Further, Katsh points out that not only texts may represent and communicate legal relationships (e.g. contractual relationships).³⁰ He moves beyond the videotaping approach by suggesting that “[t]he new technologies bring us closer to graphical means of communication, [...]”.³¹ In doing so, Katsh effectively opened the door to visual legal communication. This involves visualising both legal contents (e.g. contracts) and the results of this visualisation process, i.e. legal visualisations (e.g. contract visualisations).

2. Impacts of artificial intelligence on contract visualisation

Robots manifest artificial intelligence (AI)³² or rather own it. They “*have been slowly but steadily permeating our life in many respects, ranging from manufacturing industries to the administration of justice*”.³³ As such, they have also begun appearing in the legal context.³⁴ One relevant actor is the International Association for Contract & Commercial Management (IACCM). This promotes AI-driven contract management³⁵ and “*enables both public and private sector organizations to achieve world-class standards in their contracting and relationship management process and skills*”.³⁶

Contracts are characteristic of most jurisdictions. They are relevant, for instance, to EU law. How? For example, Articles 13, 14 and 15 of the General Data

and Legal Tech to Contracts,” Stefania Passera, Stefania Passera, accessed 10 December 2019, <https://stefaniapassera.com/2018/03/28/legaldesign-and-legaltech-to-contracts/>.

²⁶ Katsh, *Law in a Digital World*, 116; my emphases.

²⁷ Katsh, *Law in a Digital World*, 158.

²⁸ Katsh, *Law in a Digital World*, 162.

²⁹ See Katsh, *Law in a Digital World*, 162.

³⁰ See Katsh, *Law in a Digital World*, 167.

³¹ Katsh, *Law in a Digital World*, 168.

³² See Melinda F. Lohmann, “Ein europäisches Roboterrecht – überfällig oder überflüssig?” *Zeitschrift für Rechtspolitik* 6 (2017): 169.

³³ Sheikh M. Solaiman, “Legal personality of robots, corporations, idols and chimpanzees: a quest for legitimacy,” *Artificial Intelligence and Law* 25, issue 2 (2017): 156.

³⁴ See, e.g., Legal Robot, Inc., “Know what you sign”, Legal Robot, Legal Robot, accessed 10 December 2019, <https://legalrobot.com/>.

³⁵ See Ultria, “IACCM Webinar: AI Driven Contract Management – Speed and Control Can Co-exist”, Ultria, accessed 10 December 2019, <https://www.ultria.com/resources/iaccm-webinar-ai-driven-contract-management-speed-and-control-can-co-exist/>. On contracts and AI, see, e.g., Ed Walters and Morgan Wright, “Putting Artificial Intelligence to Work in Law Firms,” *AALL Spectrum* 23, No. 1 (September/October 2018): 18–19.

³⁶ IACCM, “About IACCM,” accessed 10 December 2019, <https://www.iaccm.com/about/>.

Protection Regulation (GDPR) stipulate that every individual (data subjects) is entitled to obtain and access personal information about themselves.³⁷ They are entitled to do so vis-à-vis the (data) controller, i.e. “*the natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data; [...]*” [Article 4(7) GDPR]. Controllers may be potential or actual contract partners that collect data about their counterparts (data subjects). Article 12(1) GDPR rules how personal data must be represented and communicated: “*The controller shall take appropriate measures to provide any information referred to in Articles 13 and 14 and any communication under Articles 15 to 22 and 34 relating to processing to the data subject in a concise, transparent, intelligible and easily accessible form, using clear and plain language, in particular for any information addressed specifically to a child. The information shall be provided in writing, or by other means, including, where appropriate, by electronic means. When requested by the data subject, the information may be provided orally, provided that the identity of the data subject is proven by other means*”.³⁸

This provides the statutory basis for contract or contract-related visualisation and verbo-visualisation. The data controller is required to choose electronic information “*wenn die betroffene Person bereits ihren Antrag in elektronischer Form gestellt hat*” [“if the person concerned has submitted their request in electronic form”].³⁹ The expression “*by other means*” in Article 12(1) GDPR may be interpreted as including visual and verbo-visual information.⁴⁰ In this vein, Article 12 (7) GDPR states (my emphases): “*The information to be provided to data subjects pursuant to Articles 13 and 14 may be provided in combination with standardised icons in order to give in an easily visible, intelligible and clearly legible manner a meaningful overview of the intended processing. Where the icons are presented electronically they shall be machine-readable.*”

Scholars have responded differently to this provision. According to Rossi, “*The GDPR unprecedentedly acknowledges the potential of visual elements to simplify and clarify lengthy, cumbersome legal notices and suggests machine-readable icons to provide an overview of the intended data processing.*”⁴¹ However, Tinnefeld and her co-authors are more sceptical: “*Such pictograms*

³⁷ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance), <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1575637080015&uri=CELEX:32016R0679>.

³⁸ See Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance), <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1575637080015&uri=CELEX:32016R0679>; my emphases.

³⁹ Marie-Theres Tinnefeld, Benedikt Bucher, Thomas Petri, and Hans-Joachim Hof, *Einführung in das Datenschutzrecht: Datenschutz und Informationsfreiheit in europäischer Sicht*, 7th rev. edition (Munich: Oldenbourg, 2020), 293 marginal note 203.

⁴⁰ See, e.g., Christian Bergauer and Dietmar Jahnle, *Das neue Datenschutzrecht: DSGVO und DSG* (2018) (Vienna: Jan Sramek, 2017), 72. The interpretation of Art.° 12.1 GDPR is in flux. The future will tell whether legal doctrine will pursue and specify Bergauer und Jahnle’s interpretation.

⁴¹ Arianna Rossi, “Legal Design for the General Data Protection Regulation: A Methodology for the Visualization and Communication of Legal Concepts” (PhD diss., Université du Luxembourg, 2019), <https://orbilu.uni.lu/handle/10993/39925>, 53. See also Monica Palmirani, Arianna Rossi, Michele Martoni, and Margaret Hagan, “A methodological framework to design a machine-readable privacy icon set,” in *Data Protection / LegalTech: Proceedings of the 21st International Legal Informatics Symposium IRIS 2018*, eds. Erich Schweighofer, Franz Kummer, Ahti Saarenpää, and Burkhard Schafer (Bern: Editions Weblaw & Erich Schweighofer, 2018).

can provide no more than an ‘informative overview,’ which is why they should not substitute classical information conveyance, but merely complement it. [...] It remains to be seen whether a homogeneous set of privacy icons will ever gain acceptance in practice. However attractive the idea seems at first glance, describing the complexity of data processing processes with a few symbols is very difficult. Moreover, it should be guaranteed that the persons concerned know which information the respective symbols stand for, which requires a considerable amount of communication and clarification beforehand.”⁴²

These legitimate objections raise the question of whether Article 12(7) GDPR should not include other types of visualisations than “merely” pictograms. This prescription should perhaps also have audio-visualisations (e.g. videos, audio-visual animations) in mind, which could complement “classical information.”

Against this background, this paper explores how using humanoid robots to visualise contracts might encourage moving towards creative and innovative contract and relationship management. My paper is organised as follows: Section II provides a working definition of humanoid robots. Section III briefly outlines contract visualisation while section IV considers how using humanoid robots for contract visualisation might benefit from the IACCM’s Contract Design Pattern Library. Although previous studies have examined various aspects of contract visualisation, they have not discussed the role of humanoid robots.

A caveat is in order here: This paper is somewhat speculative as the digital transformation (visual, audiovisual and multisensory) impacting our times is ongoing. Since humanoid robots are *multisensory* digital media, they are part of this transformation. I am therefore convinced that we need speculative, open-ended research.

II. Humanoid robots: a working definition⁴³

1. Robots

Robotics, dedicated to studying robots, has developed various definitions of the term “robot.”⁴⁴ For reasons of space, a generic definition must suffice: a robot is “*a machine that senses, thinks, and acts*”.⁴⁵ However, discussing what it means that machines think would lead too far.⁴⁶ Machine actions mean communicative actions or acts. Of primary interest in this paper is that robots are capable of sensing.

⁴² Tinnefeld, Bucher, Petri, and Hof, *Einführung in das Datenschutzrecht*, 293 marginal note 206. The original reads as follows: “Mehr als einen ‘aussagekräftigen Überblick’ können solcherlei Bildsymbole nicht vermitteln, weshalb sie die klassische Informationsvermittlung auch nicht ersetzen, sondern lediglich ergänzen sollen. [...] Ob sich jemals ein einheitliches Set von Privacy Icons in der Praxis durchsetzen wird, bleibt abzuwarten. So attraktiv sich die Idee auf den ersten Blick präsentiert, so schwierig ist es tatsächlich, die Komplexität der Datenverarbeitungsprozesse mit einigen wenigen Symbolen abzubilden. Gewährleistet müsste zudem sein, dass die Betroffenen überhaupt wissen, für welche Informationen die jeweiligen Symbole stehen, was wiederum ein gehöriges Maß an Kommunikation und Aufklärung im Vorfeld bedingt.”

⁴³ In my “Humanoid Robots in Legal Education,” I have already developed a working definition of humanoid robots, see Colette R. Brunschwigg, “Humanoid Robots in Legal Education,” in *Yearbook of Legal Education 2018/2019*, ed. Bernhard Bergmans (Berlin: Berliner Wissenschafts-Verlag, 2020), 264-266. Since I cannot reinvent the wheel, I adopt this working definition here.

⁴⁴ See, e.g., Natalie Nevejans, “Les robots: tentative de définition,” in *Les robots: objets scientifiques, objets de droits*, ed. Alexandra Bensamoun (Paris: Mare & Martin, 2016), 85-119.

⁴⁵ George A. Bekey, *Autonomous Robots: From Biological Inspiration to Implementation and Control* (Cambridge: The MIT Press, 2005), 2.

⁴⁶ Instead, see, e.g., Terry Winograd, “Thinking Machines: Can There Be? Are We?,” in *The Boundaries of Humanity: Humans, Animals, Machines*, eds. James J. Sheehan and Morton Sosna (Berkeley: University of California Press, 1991).

2. Multisensory robots

Based on the above working definition, a multisensory robot is a machine that *multi-senses*, “*thinks*”⁴⁷ and performs communicative actions. It is equipped with more than merely one type of sensor (multisensory technology) or actuator (motoric functions).⁴⁸ These components enable multisensory robots to receive and emit signals.

A multisensory robot receives multi-coded signals: its microphones enable this machine to “*hear*” (auditory perception), its cameras help it to “*see*” (visual perception) and its *electronic nose* allows it to “*smell*” (olfactory perception). Their actuators empower such robots to move and touch persons or objects (tactile-kinesthetic perception). Describing this multimodality of humanoid robots, González Aguirre has observed: “*The multimodal skills of a humanoid robot should be organized in a technical cognitive architecture in order to execute an intelligent and knowledge-based perception-planning-action cycle [...]. In such a cognitive architecture, the role of perception is to transform sensor signals (stimuli) to internal representations (percepts) useful to generate directed actions and reactions to achieve tasks.*”⁴⁹

In addition, a multisensory robot may act as a multimodal stimulus for its environment, by addressing more than one level of sensory perception in its human counterparts through emitting multisensory signals (technical terminology) or multisensory signs (semiotic terminology). These signals or signs address the visual, auditory and tactile-kinesthetic perception of human communication partners.⁵⁰

3. Humanoid robots as anthropomorphic multisensory robots

A humanoid robot is a multisensory robot in anthropomorphic guise⁵¹ It has “*a human-like shape ([...]) and [...] behaves in a human-like manner*”.⁵² It is equipped with “*a mobile two-arm system with five-fingered [...] hands, a flexible torso and a sensor head with visual and acoustic [and perhaps also olfactory; my insertion] sensors [...]*”.⁵³



Figure 2: NAO Robot⁵⁴

⁴⁷ Bekey, *Autonomous Robots*, 2.

⁴⁸ On components of humanoid robots, see, e.g., Albert Albers, Sven Brudniok, Jens Ottmad, Christian Sauter and Korkiad Sedchaicharn, “Design of Modules and Components for Humanoid Robots,” in *Humanoid Robots, New Development*, ed. Armando Carlos de Pina Filho (Vienna: InTech, 2007).

⁴⁹ David Israel González Aguirre, *Visual Perception for Humanoid Robots: Environmental Recognition and Localization, from Sensor Signals to Reliable 6D Poses* (Cham: Springer, 2019), 2 my emphases.

⁵⁰ Multisensory robots are also able to communicate with other multisensory robots. Currently, such an option is not relevant to legal education. Our main concern at present is to consider communication between multisensory robots and law professors or law students.

⁵¹ See, e.g., González Aguirre, *Visual Perception for Humanoid Robots*, 1.

⁵² Rüdiger Dillmann, Regine Becher and Peter Steinhaus, “Armar II—A Learning and Cooperative Multimodal Humanoid Robot System,” *International Journal of Humanoid Robotics* 1, No. 1 (2004): 144.

⁵³ Dillmann, Becher, and Steinhaus, “Armar II,” 147.

⁵⁴ Wikimedia Commons, “File: NAO Robot.jpg,” accessed October 30, 2019, https://commons.wikimedia.org/wiki/File:NAO_Robot_.jpg

III. Contract visualisation: a brief outline

Stefania Passera has characterised contract visualisation “*as the use of diagrams, images, and visually structured layouts to make contracts more searchable, readable, and understandable [...]*”.⁵⁵ This description refers to both visual and verbo-visual legal design and its purpose. Thereby, the real definition of the essential nature of “*contract visualisation*” is confounded with its purpose as the description refers solely to “*diagrams*” and “*images*.” In contrast, I would suggest that contract visualisation involves both process (i.e. visualising or verbo-visualising contractual and contract-related contents) and product (i.e. the visualised or verbo-visualised contractual or contract-related contents). I extend Passera’s enumeration of visualisations below (see Section III.2.).

1. Process

The process of visualising or verbo-visualising contractual or contract-related⁵⁶ contents raises various basic questions.⁵⁷

Who visualises or verbo-visualises contractual contents? Law professors, law students, designers, computer scientists and possibly humanoid robots are all able to visualise such contents.

Why are contractual contents visualised or verbo-visualised? One reason is that long and complex contracts are “*difficult to read or understand*”.⁵⁸ They “*may be ignored or misunderstood, and their implementation may suffer or fail*”.⁵⁹ These difficulties mean that contracts resist easy use.⁶⁰ Why is this so? As Haapio and her co-authors have suggested, “*Overly legalistic contracts can alienate business people and prevent negotiators from participating fully in creating legal agreements that should be recording the purpose and expectations among the contracting parties*”.⁶¹ Accordingly, contract visualisation and verbo-visualisation have the following *purposes* (among others):

1. *Clarifying what written language does not manage to fully explain;*
2. *Making the logic and the structure of the documents more visible;*

⁵⁵ Stefania Passera, *Beyond the wall of contract text: Visualizing contracts to foster understanding and collaboration within and across organizations* (Helsinki: Aalto University publication series, 2017), 19.

⁵⁶ For the sake of readability, I will not use the term “contract-related” again as it is implied in “contractual.”

⁵⁷ Here, I adapt, elaborate on and amplify questions that I have raised elsewhere, see Colette R. Brunchwitz, “Perspectives of Digital Law: Visualization, Audiovisualization, and Multisensorization,” *Forum historiae iuris* (May 7, 2019): marginal numbers 4–6, <https://forhistiur.de/2019-05-brunchwitz/?l=en>, and id., “Humanoid Robots in Legal Education,” 264–285.

⁵⁸ Helena Haapio, Daniela Alina Plewe and Robert de Rooy, “Next Generation Deal Design: Comics and Visual Platforms for Contracting,” in *Networks IRIS 2016: Proceedings of the 19th International Legal Informatics Symposium*, eds. Erich Schweighofer, Franz Kummer, Walter Hötendorfer and Georg Borges (Vienna: Österreichische Computergesellschaft, 2016), 374.

⁵⁹ Helena Haapio and Stefania Passera, “Contracts as interfaces: exploring visual representation patterns in contract design,” in *Legal Informatics*, eds. Daniel Martin Katz, Don Dolin and Michael Bommarito (Cambridge: Cambridge University Press, 2019), s.p. [forthcoming]. See also Helena Haapio and Margaret Hagan, “Design Patterns for Contracts,” in *Networks IRIS 2016: Proceedings of the 19th International Legal Informatics Symposium*, eds. Erich Schweighofer, Franz Kummer, Walter Hötendorfer and Georg Borges (Vienna: Österreichische Computergesellschaft, 2016), 382.

⁶⁰ See, e.g., Haapio and Passera, “Contracts as interfaces,” s.p.

⁶¹ Helena Haapio, Daniela Alina Plewe and Robert de Rooy, “Next generation deal design,” 374. See also Tania Leiman, “Where are the graphics? Communicating legal ideas effectively using images and symbols,” *Legal Education Review* 26, No. 1 (2016): 50–52. Although Tania Leiman’s reflections do not specifically address contract visualisation, they they can be adapted here *mutatis mutandis*.

3. *Giving both overview and insight into complex terms and processes;*
4. *Supporting evidence, analysis, explanation and reasoning in complex settings;*
5. *Providing an alternative access structure to contents, especially to non-experts working with the document;*
6. *Helping parties articulate tacit assumptions and clarify and align their expectations; and*
7. *Engaging stakeholder[s; my insertion] who have been alienated by the conventional look and feel of contracts.*⁶²

Hence, contract visualisation serves the purpose of “*making sure the message is understood*”⁶³. Contracts, in other words, should be easy to use.⁶⁴

Which kinds of contractual contents are visualised or verbo-visualised? Any basically, including the purpose of contracts, rights, duties, deadlines, definitions (e.g. concepts), technical information, scope and goals – to which no semiotic obstacles seem evident. For instance, Haapio and Passera maintain that “[*t*]imelines are useful for clauses that specify duration (e.g., contract term, or notice or warranty period), list of milestones, to-do’s and deadlines (e.g., payment or reporting schedules), or describe steps or processes (e.g., to terminate the agreement, give notice, perform an audit)”⁶⁵ Regarding the use of flowchart patterns, Haapio and Passera point out that these kinds of contract visuals “*offer a step-by-step approach to solving complex problems or taking decisions, by presenting simple, straightforward actions*”⁶⁶ Hence, “[*u*]sers do not need to keep in mind all the information they will need at once, but can consider one step at a time”⁶⁷. Besides, these kinds of contract visualisations “*present all the relevant information on one page in an integrated way so that it is easily accessible. Decision points, alternative paths, and possible outcomes are visible at a glance*”⁶⁸.

Which media are used to visualise or verbo-visualise contractual contents? – We need to distinguish analogue from digital media. For centuries, paper has proven useful as an analogue medium suited to incorporating contractual contents. When it comes to digital media, hardware and software interact to visualise or verbo-visualise contractual contents. Common hardware includes workstations, laptops, tablets, smartphones while many visualising or verbo-visualising programmes are available (e.g. Microsoft Visio, Microsoft PowerPoint, MindManager, SmartDraw, Inspiration, ConceptDraw, Graphviz).

Which semiotic codes are used to communicate visual or verbo-visual contractual contents? — Both the verbal and visual code are used.

Which visualisation methods are applied to visualise or verbo-visualise contractual contents? – These methods depend on the type(s) of visualisations or verbo-visualisations created: e.g. photographs, charts, diagrams, maps, pictograms. Verbocentric jurisprudence has not – yet – developed a comprehensive visual and verbo-visual methodological apparatus. It thus needs to adopt methods from other disciplines (e.g. cognitive psychology, the psychology of learning, instructional psychology, media psychology, design studies,⁶⁹ visual communication). Legal

⁶² Thomas D. Barton, “Improving Contracts through Expanding Perspectives of Understanding,” *California Western Law Review* 52, No. 1 (Fall 2015): 60.

⁶³ Haapio and Passera, “Contracts as interfaces,” s.p.

⁶⁴ See Haapio and Passera, “Contracts as interfaces,” s.p.

⁶⁵ Haapio and Passera, “Contracts as interfaces,” s.p.

⁶⁶ Haapio and Passera, “Contracts as interfaces,” s.p.

⁶⁷ Haapio and Passera, “Contracts as interfaces,” s.p.

⁶⁸ Haapio and Passera, “Contracts as interfaces,” s.p.

⁶⁹ See, e.g., Helena Haapio, *Next generation contracts: a paradigm shift* (Helsinki: Lexpert, 2013), 10–11, and Jay A. Mitchell, “Putting some product into work-product: corporate lawyers learning from designers,”

scholars have already been taking first methodological steps towards developing visual legal production methods.⁷⁰

2. Products

Contract visualisation also refers to the products of this process, i.e., the visualised or verbo-visualised contractual contents. These raise further basic questions:

Which contractual contents appear in visual or verbo-visual form? – It is still premature to answer this question. IACCM’s Contract Design Pattern Library contains some generic examples.⁷¹ In the future, empirical studies will hopefully be conducted to answer this question.

What are the purposes of contract visualisations? – Beyond those mentioned above (Section III.1), contract visualisations should complement and explain contract texts.⁷²

How can we categorise contract visualisations?⁷³ – The answer to this question depends on the chosen categorisation criterion or criteria: e.g. image types, visualised contents, purposes of contract visualisations, the types of media used. Regarding the criterion “*visualised contents*”, I propose three categories of contract visualisations: first, *visualisations of contractual issues in general*; second, *visualisations of particular contracts* (such visualisations are not incorporated in the respective contracts); third, *visualisations or verbo-visualisations as contracts or as contractual elements* (in this category, visualisations or verbo-visualisations constitute the contract or are inserted into these contracts). The question is whether these insertions are legally binding or not. In terms of image types, I distinguish depicting (representing) and non-depicting (non-representing) contract visualisations.⁷⁴ Images (e.g. photographs, schematic representations), charts (e.g. tabular charts, temporal charts, organisational charts, flow charts, networks) and diagrams are depicting contract visualisations.⁷⁵ Maps and pictograms are non-depicting contract visualisations.⁷⁶ Such contract visualisations can be two- or three-dimensional,⁷⁷ moving or static, and even interactive.⁷⁸

In which media do particular contract visualisations manifest (mediality)? – It is still premature to answer this question. At present, most contract visualisations manifest in *digital* media and thus might appear on the display screens of humanoid robots.

Berkeley Business Law Journal 12, No. 1 (2015): 11.

⁷⁰ See, e.g., Colette R. Brunschwig, *Visualisierung von Rechtsnormen: Legal Design* (Zurich: Schulthess, 2001), 80–115, 217–48, 249–63, 264–83, 284–314, and Haapio and Passera, “Contracts as interfaces,” s.p.

⁷¹ See Stefania Passera and Helena Haapio, “Explore Library,” IACCM Contract Design Pattern Library, IACCM, [https://contract-design.iaccm.com/library?filter&tag-filters\[\]=visuals](https://contract-design.iaccm.com/library?filter&tag-filters[]=visuals).

⁷² See, e.g., Stefania Passera, Anssi Smedlund and Marja Liinasuo, “Exploring contract visualization: clarification and framing strategies to shape collaborative business relationships,” *Journal of Strategic Contracting and Negotiation* 2, issue 1–2 (2016): 70–73.

⁷³ For another categorisation of contract visualisations, see, e.g., Haapio, Plewe and de Rooy, “Next generation deal design,” 376–79.

⁷⁴ Steffen-Peter Ballstaedt, *Visualisieren: Bilder in wissenschaftlichen Texten* (Constance: UVK Verlagsgesellschaft, 2012), 19. Steffen-Peter Ballstaedt’s categorisation does not specifically address contract visualisation. Even so, the latter might benefit from the former.

⁷⁵ See Ballstaedt, *Visualisieren*, 19.

⁷⁶ See Ballstaedt, *Visualisieren*, 19.

⁷⁷ On three-dimensional contract visualisations, see, e.g., Marc Lauritsen, “Enhancing Contract Playbooks with Interactive Intelligence – Part II,” *RAIL: The Journal of Robotics, Artificial Intelligence & Law* 1, No. 6 (November–December 2018): 386–94.

⁷⁸ See, e.g., Lauritsen, “Enhancing Contract Playbooks with Interactive Intelligence,” 385, 390.

In which semiotic codes do contract visualisations appear (codality)? – Contract visualisations materialise in the visual and verbo-visual code.

Which perceptual mode do contract visualisations appeal to or which mode are they capable of (modality)? – Both contract visualisations and verbo-visualisations appeal to the sense of sight.

Who are the recipients or addressees of contract visualisations? – contract parties, lawyers, mediators, arbitrators and judges.

How do contract visualisations affect their recipients? For instance, how do contract parties experience and behave towards such materials? – Only scarce empirical research exists so far on these questions.⁷⁹ Previous studies have found that contract visualisations enable recipients to better assimilate, process and memorise contractual contents.⁸⁰ Contract visualisations demystify the work of those dealing with contracting and contracts.⁸¹ It is conceivable that contract visualisations generate positive feelings towards these contents. In some circumstances, contract visualisations may even enhance commitment to these contents⁸² and thus deflect “*the risk of inadvertent noncompliance [...]*”⁸³

Which methods can be applied to describe, analyse (interpret) and evaluate contract visualisations? – As a rule, the methods of legal interpretation apply only to texts, such as rules and contracts (verbocentric legal hermeneutics). This, however, is highly problematic in today’s visual and audiovisual digital world: “[*Legal; my insertion*] [*i*] *images can scarcely – or only unsatisfactorily – be interpreted using the normal methods of the law*”.⁸⁴ Different types of legal visualisations and thus contract visualisations call for distinct methods of interpretation and evaluation. For instance, charts need to be analysed differently than photographs.⁸⁵

How do visualisations help interpret contracts?⁸⁶ Does it make a difference whether they are binding elements of a contract or not? – I am not aware of any studies that have attempted to wrestle with these questions.

Should verbo-visuals and visuals *in* contracts be binding elements of such documents or not (i.e. contracts as verbo-visuals)?⁸⁷ If so, contract interpretation needs to decode the verbally, visually and verbo-visually encoded contents. Such

⁷⁹ See, e.g., Stefania Passera, “Beyond the Wall of Text: How Information Design Can Make Contracts User-Friendly,” in *Design, User Experience, and Usability: Users and Interactions*, ed. Aaron Marcus (Cham: Springer, 2015), 345–351. See also Stefania Passera, Anne Kankaanranta and Leena Louhiala-Slminen, “Diagrams in Contracts: Fostering Understanding in Global Business Communication,” *IEEE Transactions on Professional Communication* 60, issue 2 (2017): 127–39.

⁸⁰ See, e.g., Haapio, Plewe, and de Rooy, “Next generation deal design,” 376–78. For further impacts, see, e.g., Passera, Smedlund, and Liinasuo, “Exploring contract visualization,” 85.

⁸¹ See, e.g., Lauritsen, “Enhancing contract playbooks with interactive intelligence,” 388.

⁸² See *ibid.*, 377. Similarly, see Lauritsen, 396–97., who also mentions the positive economic impacts of contract visualisation.

⁸³ Jay A. Mitchell, “Putting some product into work-product,” 23.

⁸⁴ Volker Boehme-Neßler, *Pictorial Law: modern law and the power of pictures* (Berlin: Springer, 2011), 183. In my understanding, legal visualisations can be considered to be legal images.

⁸⁵ On analysing charts, see, e.g., Steffen-Peter Ballstaedt, *Wissensvermittlung: Die Gestaltung von Lernmaterial* (Weinheim: Psychologie Verlags Union, 1997), 114–16. On analyzing pictures (*Abbilder*), see, e.g., *ibid.*, 207–09.

⁸⁶ Thomas D. Barton, Gerlinde Berger-Walliser and Helena Haapio inspired me to raise this question, see Thomas D. Barton, Gerlinde Berger-Walliser and Helena Haapio, “Visualization: seeing contracts for what they are, and what they could become,” *Journal of Law, Business and Ethics* 19 (2013): 54.

⁸⁷ Gerlinde Berger-Walliser, Robert C. Bird and Helena Haapio have inspired me to raise this question (see Berger-Walliser, Bird, and Haapio, “Promoting Business Success through Contract Visualization,” 57).

considerations are important if courts have to rule or decide cases where contract parties are also litigating about the “right” interpretation of legally binding visual and verbo-visual contents.

3. Further aspects

The question about what contract-related visual literacy⁸⁸ means refers to the production process and to contracts as products. The same questions (above Sections III.1 and 2.) could be raised *mutatis mutandis* about contract audio-visualisation (e.g. contractual or contract-related videos, films and audiovisual animations).

Contract visualisation plays a role “during each of the stages of the *contracting lifecycle* ([...]): *planning, negotiating, signing, implementing, monitoring, and eventually exiting the agreement.*”⁸⁹ Since such visualisations belong to the “family” of legal visualisations, contract visualisation can be associated with so-called visual law⁹⁰. Contract visualisation also relates to other areas of law (e.g. proactive and preventive law,⁹¹ contract law, business law, EU law, legal design, legal theory, legal informatics, law and economics, legal linguistics,⁹² and legal psychology). Contract visualisation has begun attracting growing interest among scholars and practitioners, law faculties, business⁹³ and industry⁹⁴ — even if it is not yet formally taught.

IV. Humanoid robots and IACCM’s Contract Design Pattern Library

1. Patterns, design patterns and design pattern libraries

Merriam-Webster’s *Dictionary of American English* provides various definitions of the noun “*pattern*”, including “*a form or model proposed for imitation*” or “*something designed or used as a model for making things.*”⁹⁵

⁸⁸ On contractual literacy, see, e.g., Berger-Walliser, Bird and Haapio, “Promoting Business Success through Contract Visualization,” 62.

⁸⁹ Passera, *Beyond the wall of contract text*, 19. Similarly, see, e.g., Thomas D. Barton, Gerlinde Berger-Walliser and Helena Haapio, “Visualization: Seeing Contracts for What They Are, and What They Could Become,” *Journal of Law, Business and Ethics* 19 (2013): 48, and Haapio and Hagan, “Design Patterns for Contracts,” 386.

⁹⁰ See, e.g., Colette R. Brunschwig, “On Visual Law: Visual Legal Communication Practices and Their Scholarly Exploration,” in *Zeichen und Zauber des Rechts: Festschrift für Friedrich Lachmayer*, eds. Erich Schweighofer, Meinrad Handstanger, Harald Hoffmann, Franz Kummer, Edmund Primosch, Günther Scheffbeck, and Gloria Withalm (Bern: Editions Weblaw, 2014), 911, 915. See also Barton, Berger-Walliser, and Haapio, “Visualization,” 56, and Rossana Ducato, “De iurisprudencia picturata: brief notes on law and visualisation,” *JOAL* 7, No. 1 (2019): 3.

⁹¹ See, e.g., Gerlinde Berger-Walliser, Robert C. Bird and Helena Haapio, “Promoting Business Success through Contract Visualization,” *Journal of Law, Business and Ethics* 55 (2011): 57–62, and Passera, *Beyond the wall of contract text*, 21–22.

⁹² See, e.g., Bert Eichorn and Ralph Schuhmann, “Der Inhalt ist alles, die Form nur Ästhetik? – Leichtverständliche Sprache und Visualisierung für Projektverträge,” *ZfBR* 3 (2014): 213–14.

⁹³ In 2016, Swiss Re hosted a conference where contract visualisation was a key topic (see Swiss Re Institute, “International Conference on Contract Simplification,” Events, Swiss Re, accessed 10 December 2019, <https://www.swissre.com/institute/conferences/contract-simplification.html#tab2>). See also, e.g., Bruce Love, “Can contracts use pictures instead of words? Visuals and plain language make an adversarial process more contractive,” *Financial Times*, October 23, 2019, <https://www.ft.com/content/032ddcb0-e6b1-11e9-b8e0-026e07cbe5b4>.

⁹⁴ For instance, Asea Brown Boveri Ltd (ABB) hosted and sponsored the IACCM member meeting of 10 December 2019, where contract visualisation was an important subject matter.

⁹⁵ Merriam-Webster, “*pattern*,” 3 March 2020, <https://www.merriam-webster.com/dictionary/pattern>.

A design pattern “*first describes a problem which occurs repeatedly, and then gives the core of a solution which the designer can use over and over again, without repeating it precisely ([...])*”.⁹⁶ Design patterns “*offer the benefits to: 1) identify best practices and standards on efficient solutions for a given problem; 2) expunge the ‘Babel’ of technical languages, by providing a problem-based syntax to people working in different domains [...]*”.⁹⁷ These patterns have also begun playing an important role in visually designing legal contents. Today, visual legal design patterns are “*scattered among heterogeneous sources and libraries*.”⁹⁸ These patterns can be structured as follows: a definition of what the pattern is; a description of which problems it solves, when it can be used, why it should be used, and where.⁹⁹

What are (*design*) *pattern libraries*? These (online) places, in which these forms or models proposed for imitation are housed, “*have become a way to share solutions, not only for architects, but also for interaction designers, software designers, and information designers ([...])*.”¹⁰⁰ These libraries “*seek to promote high quality, efficient, and consistent work, and a lingua franca among collaborators coming from different domains*.”¹⁰¹

Since “[*c*]ontracts can be seen as information products ([...])”,¹⁰² they constitute (information) design products. As such, contracts or some of their clauses lend themselves to being used as design patterns and integrated into pattern libraries. In connection with contracts, language and style, content, boilerplates and “[*t*]emplates may play an important role in design patterns”.¹⁰³ The latter, however, are not confined to verbal elements recurring in contracts. Rather, (contract) design patterns relate to how contracts “*are presented and communicated*”.¹⁰⁴ These patterns “*refer to methods and solutions that make things easier to understand and tools more useful and usable*”.¹⁰⁵ Contract design patterns “*are suggestions, not requirements. They are flexible tools, to be customized as needed in a certain situation, rather than to be copied exactly like boilerplate[s; my insertion]*”.¹⁰⁶ These “*patterns can be mixed, modified, and adapted to fit specific contracting situations and user needs*”.¹⁰⁷

2. IACCM’s Contract Design Pattern Library

The IACCM Contract Design Pattern Library contains various pattern families: emphasis, explainers, layering, layout, navigation, organising, reviewing, summarising, tone of voice and visuals.¹⁰⁸ Especially relevant to contract visualisation and verbo-

⁹⁶ Haapio and Passera, “Contracts as interfaces,” s.p. See also Haapio and Hagan, “Design Patterns for Contracts,” 381, and Arianna Rossi, Rossana Ducato, Helena Haapio, Stefania Passera and Monica Palmirani, “Legal Design Patterns: Towards a New Language for Legal Information Design,” in *Internet of Things IRIS 2019: Proceedings of the 22nd International Legal Informatics Symposium*, eds. Erich Schweighofer, Franz Kummer, and Ahti Saarenpää (Bern: Editions Weblaw, 2019), 517.

⁹⁷ Rossi et al., “Legal Design Patterns,” 517.

⁹⁸ Rossi et al., “Legal Design Patterns,” 518.

⁹⁹ See, e.g., Rossi et al., “Legal Design Patterns,” 519. See also Stefania Passera, Helena Haapio and IACCM, “Flowchart,” IACCM Contract Design Pattern Library, IACCM, 3 March 2020, <https://contract-design.iaccm.com/flowchart?category%5B0%5D=visuals>.

¹⁰⁰ Haapio and Passera, “Contracts as interfaces,” s.p. See also Haapio and Hagan, “Design Patterns for Contracts,” 383.

¹⁰¹ Haapio and Hagan, “Design Patterns for Contracts,” 383.

¹⁰² Haapio and Passera, “Contracts as interfaces,” s.p.

¹⁰³ Haapio and Hagan, “Design Patterns for Contracts,” 383.

¹⁰⁴ Haapio and Hagan, “Design Patterns for Contracts,” 386.

¹⁰⁵ Haapio and Hagan, “Design Patterns for Contracts,” 383.

¹⁰⁶ Haapio and Hagan, “Design Patterns for Contracts,” 384.

¹⁰⁷ Haapio and Passera, “Contracts as interfaces,” s.p.

¹⁰⁸ See IACCM, Stefania Passera and Helena Haapio, “Explore Library,” IACCM Contract Design

visualisation are layout, organising and visual design patterns.¹⁰⁹ Contract visualisation patterns include contract comics, “[c]ompanion icons,” contract document maps, delivery diagrams, flow charts, visual emphases, pictograms, swimlanes,¹¹⁰ tables, and timelines.¹¹¹ Unfortunately, not all patterns are publicly available. First, these patterns can be used to visualise or verbo-visualise contractual issues in general (e.g. the definition of a contract, its purpose, validity, and so forth). Second, these patterns can be used to visualise or verbo-visualise the contents of a particular contract. In practice, business and industry (banks, insurances, and so forth) might supplement their contracts with such illustrative patterns. These patterns would be embedded in a supplement to the actual contract document. Third, the visual and verbo-visual patterns are integrated into the contractual document and are therefore legally binding – except if a clause or clauses exclude that these patterns are legally binding.

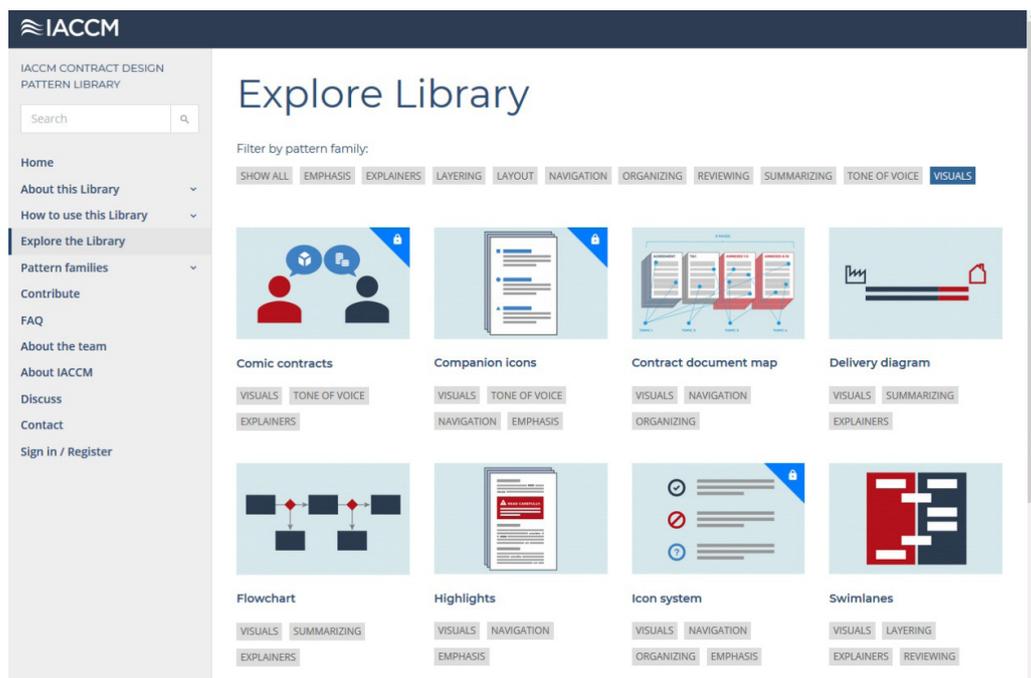


Figure 3: Explore Library—Visuals (Screenshot)¹¹²

Pattern Library, IACCM, accessed 3 March 2020, <https://contract-design.iaccm.com/library>.

¹⁰⁹ See IACCM, Stefania Passera and Helena Haapio, “Explore Library: Visuals,” IACCM Contract Design Pattern Library, IACCM, accessed 3 March 2020, [https://contract-design.iaccm.com/library?filter&tag-filters\[\]=visuals](https://contract-design.iaccm.com/library?filter&tag-filters[]=visuals).

¹¹⁰ These visualisations “are used to show how roles, rights, tasks, responsibilities, obligations, liabilities or remedies are distributed between different parties. Each party’s area of responsibility is represented by a column, or lane, where the items are assigned.” IACCM, Stefania Passera, and Helena Haapio, “Swimlanes,” IACCM Contract Design Pattern Library, IACCM, accessed 3 March 2020, <https://contract-design.iaccm.com/swimlanes?category%5B0%5D=visuals>.

¹¹¹ See IACCM, Stefania Passera and Helena Haapio, “Explore Library: Visuals,” IACCM Contract Design Pattern Library, IACCM, accessed 3 March 2020, [https://contract-design.iaccm.com/library?filter&tag-filters\[\]=visuals](https://contract-design.iaccm.com/library?filter&tag-filters[]=visuals).

¹¹² © IACCM, Stefania Passera, and Helena Haapio. Used with permission. Source: IACCM, Stefania Passera and Helena Haapio, “Visuals,” IACCM Contract Design Pattern Library, IACCM, accessed 3 March 2020, <https://contract-design.iaccm.com/library/visuals>.

3. How humanoid robots might use visuals from the IACCM’s Contract Design Pattern Library

3.1. Flow charts as a case in point

Contract visualisation applies flow charts to “*clauses that describe processes where different decisions determine possible alternative outcomes (e.g. price change, change management, complaint escalation, remedies to contract breach)*”.¹¹³

Take the case of the Shell Marine Lubricants Terms & Conditions. Here, the flow chart “*is used when price changes enter into effect and what happens if a customer objects*”.¹¹⁴

Flowchart

🔍 Pattern
📄 Examples
← Comment

Example 1

Shell Marine Lubricants Terms & Conditions

A flowchart is used to clarify when price changes enter into effect and what happens if a customer objects.

Source: [Shell Marine Lubricants Terms & Conditions](#)

© 2018 Royal Dutch Shell plc. Used with permission.
Designer: [Rob Waller](#)

3 Price

We hold the price for 30 days

```

graph TD
    A[We give you at least 30 days notice of a price rise] --> B{You object within 30 days?}
    B -- N --> C[New price]
    B -- Y --> D[We meet to discuss within 30 days]
    D --> E{Agreement within 10 days?}
    E -- Y --> C
    E -- N --> F[You can terminate agreement with 30 days notice]
                    
```

3.1 The price of the Marine Lubricants will be the price shown in the Price List which is in force on the date we receive the Nomination from you.
This price is valid for 30 days from the date of the Nomination. If Delivery takes place after this 30 days period, the price shown in the updated Price List will apply.

3.2 We will provide you with at least 30 days’ prior written notice of any proposed changes to the price which results from a price review and/or to the range of Marine Lubricants available.
If you think the increased price is unreasonable, you may, within 30 days of receiving our notification, notify us of this in writing (Objection).
Within 10 days of receipt of your Objection, a representative from your company and our account manager (Representatives) shall confer at least once to discuss the matter in good faith and seek to resolve it in an amicable manner.
If the Representatives are unable to reach agreement within ten business days of a referral being made to them then you may terminate the Agreement by giving us 30 days written notice.

Figure 4: Flow chart of the Shell Marine Lubricants Terms & Conditions¹¹⁵

Let us imagine a lawyer tasking their humanoid robot with visualising clause 3.2 of the Shell Marine Lubricants Terms & Conditions. Let us further assume

¹¹³ IACCM, Stefania Passera, and Helena Haapio, “Flowchart,” IACCM Contract Design Pattern Library, IACCM, accessed 3 March 2020, <https://contract-design.iaccm.com/flowchart?category%5B0%5D=visuals>; original emphases.

¹¹⁴ IACCM, Stefania Passera, and Helena Haapio, “Flowchart,” IACCM Contract Design Pattern Library, IACCM, accessed 3 March 2020, <https://contract-design.iaccm.com/flowchart?category%5B0%5D=visuals>.

¹¹⁵ © Royal Duch Shell plc. and Rob Waller. Used with permission. Source: IACCM, Stefania Passera, and Helena Haapio, “Flowchart,” IACCM Contract Design Pattern Library, IACCM, accessed 3 March 2020, <https://contract-design.iaccm.com/flowchart?category%5B0%5D=visuals>.

that neither the lawyer nor the humanoid robot know about the IACCM's Contract Design Pattern Library.

3.2. Option one

Provided the humanoid robot is connected to the Internet and programmed accordingly, it would search Google and find IACCM's Contract Design Pattern Library. It would then search the Library for visualisations "*that describe processes where different decisions determine possible alternative outcomes (e.g., price change, [...])*".¹¹⁶ Next, it would locate IACCM's "Flowchart" page. It would click "Examples" and find the visualised version of clause 3.2 of the Shell Marine Lubricants Terms & Conditions. It would discuss the search result with software agents (bots) to determine whether other visual solutions exist for visualising the clause.

The humanoid robot would convey its preliminary search result orally to "its" lawyer. If fitted with a display screen enabling online access, the robot could present the result visually or even audio-visually, by speaking to the lawyer, while presenting the flow chart.

3.3. Option two

After searching the Internet and discussing its assignment (i.e. visualising clause 3.2 of the Shell Marine Lubricants Terms & Conditions) with bots (software agents), the humanoid robot would create the flow chart or another appropriate visualisation on its own. How might it perform this task?

Again, provided that the robot has been programmed accordingly and equipped with the necessary cognitive and motoric skills, it could draw the flow chart or another suitable visualisation using pertinent software (e.g. SmartDraw, MindManager, Graphviz, or Microsoft Visio) on a computer (e.g., personal computer, laptop, tablet).

The humanoid robot might also draw the specific contract visualisation with a graphic tablet. Or the robot could create the flow chart using non-digital media, for instance, pen and paper.

V. Findings, conclusions and outlook

1. Findings

This paper has outlined contract visualisation as a process and product, in order to systematise this complex phenomenon. Contractual visual literacy involves having knowledge and know-how of this process and product. Since most law faculties do not – yet – offer their students the opportunity of becoming visually literate regarding law in general and contracting and contracts in particular, it is uncertain what is needed to change legal education. One answer, delineated here, is to teach visual and verbo-visual contract patterns, as these enable "*practitioners and researchers alike to identify and share effective solutions for planning, negotiating, and communicating contracts*".¹¹⁷ It is only a matter of time until humanoid robots for contract visualisation will also use those patterns.

¹¹⁶ IACCM, Stefania Passera, and Helena Haapio, "Flowchart," IACCM Contract Design Pattern Library, IACCM, accessed 3 March 2020, <https://contract-design.iaccm.com/flowchart?category%5B0%5D=visuals>.

¹¹⁷ Haapio and Passera, "Contracts as interfaces," s.p.

2. Conclusions

Because “so many different means of communication” are at our disposal, “we often must choose among media, and make decisions about *how* to communicate as well as *what* to communicate”¹¹⁸. In this light, we need to decide whether we really want to communicate legally with humanoid robots and whether they should visualise and thus communicate contracts. I agree with Passera’s point that “*It is not enough to restructure texts in a meaningful, sensible way in order to make them more comprehensible. The visual presentation of legal texts strongly affects comprehensibility and accessibility, making meaning more immediately available to readers*”.¹¹⁹ Accordingly, humanoid robots should represent and communicate contracts visually and verbo-visually to make such documents easily accessible to and comprehensible for users.

Given that contract documents and “*the underlying law*” are not “*static*,”¹²⁰ it should also be possible to adjust contract visualisations. The electronic format might help humans and even humanoid robots attain such an objective.

Boehme-Neßler has suggested that “[l]egal dogmatics will have to develop new methods which are suitable for interpreting visual legal communication”.¹²¹ On the one hand, this implies that we also need new hermeneutics of visual contract communication (i.e. contract visualisations). On the other, Boehme-Neßler considers that traditional legal interpretation methods ought to be extended in order to analyse legal visualisations.¹²² Thus, we need to work out how verbocentric contractual interpretation methods might help examine contract visualisations. Should we have recourse to the contract visualiser’s intention? In any case, the methods of cognitive psychology, the psychology of learning, instructional psychology, media psychology, design studies, visual communication and other non-legal disciplines will help expand traditional legal interpretation methods.

We need to research what visual *and* audio-visual literacy might involve, also regarding contracting and contracts. We thus need to enter and discover contract audio-visualisation (contractual or contract-related videos, films, audiovisual animations) as a field and practice in its own right.

Legal scholars need to explore whether visual and verbo-visual design patterns can be applied to law in general.¹²³ Such research is called for because these patterns either depend on the area of law concerned or are area-independent.¹²⁴ Regarding the first, dependent type of visual and verbo-visual design patterns, do we need to proceed inductively? Do we need to establish which areas of law visual and verbo-visual legal design patterns might be used in before we create area-specific patterns? My initial research leads me to suggest the following areas: visual legislation, visual legal sources, visual court rulings, visual customary law, visual legal education, visual legal research, visual state legal practice, visual private legal practice, visual justice, visual legal and legally relevant facts, and other visual legally relevant contents. I welcome the first steps towards developing visual and verbo-visual legal design patterns that would apply to law in general. In taking these epistemological steps, we ought to consider the characteristics of particular jurisdictions.

¹¹⁸ Katsh, *Law in a Digital World*, 133; my emphases.

¹¹⁹ Passera, “Beyond the Wall of Text,” 351.

¹²⁰ Mitchell, “Putting Some Product into Work-Product,” 24.

¹²¹ Boehme-Neßler, *Pictorial Law*, 183.

¹²² See Boehme-Neßler, *Pictorial Law*, 183.

¹²³ See, e.g., Rossi et al., “Legal Design Patterns,” (2019).

¹²⁴ See, e.g., Rossi et al., “Legal Design Patterns,” 518.

Assuming that “[d]eals are dances[.]” Lauritsen suggests that we use “*a graphical notation for the choreography of contracting*”.¹²⁵ The IACCM’s Contract Design Pattern Library constitutes an important path towards such a “*choreography*.” Hence, the Library needs to be extended, particularly with patterns suited to contract visualisation and verbo-visualisation.

I call upon business and industry to create the first prototypes of humanoid robots capable of legal visualisation, especially contract visualisation. Such developments might crystallise further options for visualising and verbo-visualising legal contents, above all contracts.

3. Outlook

The growing number of publications on visual law and contract visualisation is likely to make legal actors more “[...] *interested in how other professionals go about [visual and verbo-visual; my insertion] communication tasks*”.¹²⁶ Legal actors will “*look at examples of great communication executions from other contexts*”.¹²⁷ For instance, they will hopefully study visual design and visual communication. In this respect, Mitchell considers law faculties as “*possible source[s] of document design innovation*”.¹²⁸ At US-American law schools, “[d]octrinal, legal writing, and clinical classes all provide avenues for exploring how to verbally, visually, and verbo-visually design well contracts and other legal documents”.¹²⁹ In Europe, future classes on contract law, legal theory, digital law or other areas will (again hopefully) open such passageways for theory and practice.

Courts may be expected to rule whether the traditional contract interpretation method is – *mutatis mutandis* – best suited to interpreting contract visualisations. Pertinent legislation will follow. Article 12.1 GDPR and Article 12.7 GDPR will perhaps serve as starting points for further EU legislation that will allow for or even mandate the visualisation or verbo-visualisation of legal contents.

Perhaps future generations of lawyers will self-evidently be visually and audio-visually literate, also in relation to contracts. Over time, it will become apparent which disciplines will investigate contract visualisation and humanoid robots for contract visualisation. Further, various disciplines might continue to investigate and also teach these topics.

Visual and verbo-visual design patterns will “*offer flexibility in contract design: [...]*”.¹³⁰ So what might audiovisual legal design patterns (e.g. videos, audiovisual animations) look like?

Creating and maintaining design pattern libraries involves significant effort.¹³¹ Saying that, will the IACCM manage to sustain its Library in future? Some design patterns are still not freely accessible (access requires IACCM membership). Will academic institutions assume the task of creating and maintaining open-access Legal Design Pattern Libraries? Alternatively, will they prioritise legal image databases or blockchains and related technologies for recording visual and verbo-visual legal information? Which role will legal image databases and blockchain play in contract visualisation? Will these technologies be better suited to systematising legal

¹²⁵ Lauritsen, “Enhancing contract playbooks with interactive intelligence,” 400.

¹²⁶ Mitchell, “Putting some product into work-product,” 6.

¹²⁷ Mitchell, “Putting some product into work-product,” 6.

¹²⁸ Mitchell, “Putting some product into work-product,” 40.

¹²⁹ See, e.g., Mitchell, “Putting some product into work-product,” 40.

¹³⁰ Haapio and Passera, “Contracts as interfaces,” s.p.

¹³¹ See, e.g., Haapio and Hagan, “Design patterns for contracts,” 384.

visualisations and contract visualisations? As far as we know today, these technologies might complement legal design pattern libraries.

What lies ahead? Robo legal designers and thus Robo contract designers? Rather than answering this still elusive question, I close with Collins and Skover's prescient words of 1992: "*Law in the electronic milieu is just beginning to break out of the confines of the print era and assert itself fully. Any judgment of paratexts [and humanoid robots for contract visualisation; my insertion], therefore is necessarily more speculative than certain. For now, it is enough to 'say' that we are entering a challenging era, one in which law will no longer be confined by print. For better or for worse, law, like Prometheus, may soon be unbound...*"¹³²

¹³² Collins and Skover, "Paratexts," 552.