Chapter 8

Conclusion on Automated Dispute Prevention

In the conclusion chapter, we answer the six RQs in Section 8.1. Then, we address the problem statement and clearly identify the research results together with their conclusions in Section 8.2. Lastly, in Section 8.3, future research directions are proposed with the intent of furthering our research.

8.1 Answer to Research Questions

Below, the RQs are reiterated as formulated in Chapter 1. Each question is answered separately.

> **RQ1:** *To what extent is it possible to develop an ontology to automate contracts with communications and risk data?*

The answer to the RQ is that defining an ontology for the purpose of automating contracts with communications and risk data is possible. However, it remains essential to test extensively its *validity* and to conduct further research to ensure that an adequate level of *trustworthiness* will be reached for any action in which the legal expert and the contractors are involved. This should happen additionally to any research already conducted. The finding that *none* of the contract automation solutions in the Legalcomplex database simultaneously focusses on both automating contract communications *and* risk data demonstrate a significant omission in the existing solutions. This omission justifies our scientific attention to the subject. Our aims for this research were (1) to bridge the gap between smart contracts and iContracts and (2) to clarify our stance. All in all, we may conclude that automating a contract based on communications and risk processes, which have long been neglected, can prove to be the *missing link* in

realising both self-executing contracts and iContracts. Our research concerning the market adoption of iContracts with the utilisation of communication and risk data is now *in its early stages*. Still, our experiment with the Onassis Ontology as well as our parallel research on EBTO and the prototype of our ontology show that there is sufficient potential to optimize the contracting process.

> **RQ2:** *To what extent is it possible to translate the Bow-Tie Method into a visualisation of an ontology for contract risk management without altering the bow-tie structure?*

The conversion process of the bow-tie conceptualisation into ontological terms is characterised as highlighting the presence of (1) missing relationships between entities in the Bow-Tie Method and (2) missing ISO-specified concepts. To reduce the possibility of introducing ambiguity into the analytical and management processes of risk data, we searched for and found additional relationships between entities in the ontology compared to those that are already represented in the Bow-Tie Method. Ultimately, we added the missing ISO-specified concepts, so far not present in the Bow-Tie Method. It resulted in (1) a new version of the bow-tie visualisation medium and (2) an openly-accessible ontological model to manage and describe risk data.

> **RQ3:** *To what extent is it possible to improve user trustworthiness for Intelligent Contracts via the visualisation of risk during legal question-answering?*

The answer to RQ3 is that *user trustworthiness* can only be relatively improved to the extent that the visualisation of risk is sufficiently explainable for end users; although it is not yet explainable to a sufficient degree for end users, soon we will be able to project a sufficient NPS. We measured it by a practical test and found a reward factor of seven point nine (7.9) (in a scale from one to ten) based on risk explanation via the use of the Enriched Bow-Tie Ontology. There is, indeed, sufficient space for an increased trustworthiness by further improving the risk visualisation from the users' perspective. Beyond the positive impact on trustworthiness, end users have found added benefits to their levels of productivity, anxiety and satisfaction. So they were motivated to refer this way of working to their peers. Finally, we remark that the reasons for the detractor scores mostly relate to (1) personal user expectations and (2) lack of trust for computers in general. The survey sees only on the relation to matters related to risk. Therefore, certain users will continue to display a low level of trustworthiness even with follow up improvements.

> **RQ4:** *To what extent is it possible to generate quality Proactive Control Data to improve an Intelligent Contract?*

Proactive Data is a valuable asset in shifting iContracts towards minimising the likelihood of hazardous events. This also includes any dispute that leads to additional legal costs. The extent to which Proactive Data has impact on an Intelligent Contract depends on (1) their quantitative identification, (2) their qualitative assessment, and (3) the use of relevant technologies that integrate the risk assessment (based on communication) data after a contract has been generated. Our research shows that the plain generation of PCD is possible with the currently available technologies. Moreover, it shows that PCD can be quantitatively generated with the application of the EBTO and can be qualitatively assessed with the Logocratic Method. To achieve a higher degree of quality, efficiency is reduced; although we estimate that with the advancement of technology, this ratio will gradually improve towards a higher level of efficiency. Even though the application of the Logocratic Method does not guarantee "absolute truth", its application is highly valuable and preferable — or as the statistician George Box stated: "all models are wrong, but some are useful" [Box, 2013]. The currently available technologies are already sufficient in implementing the findings of our research. Hence, the impact of Proactive Data on iContracts has certainly the potential to be significant in the future, yet it depends on (1) the specific application preferences of an organisation, (2) their resource allocation, and (3) issues related to technological innovation. Therefore, the answer to RQ4 is that (1) the generation of PCD is possible, (2) their impact on contract drafting is significant, and (3) the generation of quality PCD is sufficiently possible.

> **RQ5:** *To what extent is it possible to develop an explainable and trustworthy Preventive Legal Technology?*

Developing Explainable and Trustoworthy PLT is possible to the extent that the generation of sufficiently trustworthy explanations supporting the Proactive Data decision-making is viable when evaluated with the help of the practical ethical standards of transparency and accountability.

> **RQ6:** *To what extent is it possible to accelerate the adoption of Intelligent Contracts with Explainable Large Language Models?*

The answer is that Explainable LLMs, as a category of Generative AI, have the possibility to accelerate the adoption of iContracts to the extent that they apply to the categories that are currently underrepresented by the competing contracting alternatives, namely contract (1) negotiations, (2) risk management, and (3) drafting. This may be so because of two characteristics for Explainable LLMs. *First*, Generative AI can make the laborious human tasks involved in the three categories simpler. *Second*, the explainability aspect can increase the end user's trustworthiness significantly by supporting the outputs of Generative AI with

explicit explanations. To further leverage explainability, we advise compliance with the "culture of explanations". Hence, the developers of decoders should be *connoisseurs* of the culture in which the system operates when given the task to make (1) an explicit presentation of sources supporting data outputs and (2) an explicit representation of the line of reasoning supporting algorithmic models.

8.2 Answer to Problem Statement

We are now in the position to answer the PS based on the answers to the RQs provided above.

PS: *To what extent is it possible to automate the prevention of disputes?*

The automated prevention of disputes is possible to the extent that a relevant technological infrastructure is established to facilitate such type of automation. Initially, the successful prevention will be possible for use cases with a simpler scope, such as use cases with freelancing projects. Gradually, more complex case studies can be examined, with the goal of eventually automating even Foreign Direct Investment (FDI) energy project agreements. The progress from simpler to more complex case studies is possible owing to (1) the gradual increase and improvement of data and (2) the relative iterative improvement of technology. While scaling up the technology application, the categorisation of use cases is important owing to the contextual nature of disputes. The success depends on the use case itself as well as on the application specific parameters.

A significant legal challenge lies with privacy and data protection of proactive data. If proactive data are systematised in computational systems, the gathering of such data should be permissible under law for so long as it is justified on legitimate purposes. The balance lies in collecting lawful data without exposing vulnerabilities to parties who can take advantage of such sensitive data, considering that Proactive Data could be used as a source for exploitation. Hence, while prioritising a lawful data collection for legitimate purposes, it is also essential to safeguard data with security measures.

Here, it is worth mentioning that establishing such a technological infrastructure for business projects should have priority over consumer or citizen activities. In business settings, a higher degree of control can be reached, due to various reasons ranging from data sensitivity in data collection to rationalisation of complex planning.

With the development of *automated dispute resolution*, disputes, especially in the context of professional projects, can be reduced significantly in number and intensity. That is, of course, never possible in absolute terms, since most

disputes are motivated by political purposes or are caused by *black swan* events. Yet, the impact of dispute prevention will be fundamental, in particular for the dispute resolution economy, which is essential for the legal system.

Our expectation is that (1) this thesis has successfully shown how automated dispute prevention is possible and that (2) our future actions will contribute toward making the impossible real. Otherwise stated as the entrepreneur and investor Vinod Khosla has said: *imagine the possible and take it from impossible to improbable to possible, but then again unlikely to plausible to probably to real!* [1].

8.3 Future Research

The future research suggestions for each RQ have already been provided within each corresponding Chapter. At this point, we are interested in providing a general research suggestion for the PS.

Preventing disputes, presupposes the taking of preventive actions on multiple levels that may lead to a dispute. In this research we have primarily focused on contracts. Chapter 6 shows the possibility of applying our research in more LegalTech domains beyond contracting. Still, applying preventive practices solely within the scope of LegalTech is not sufficient. Usually a dispute is influenced by legal, and also by a range of divergent factors including financial, project management, social, governmental and many more factors. The common thread among all factors is human *argumentation* (this idea is compliant with the general theory of the Logocratic Method examined in Chapter 5). After all, before we act in finance, law or governance, people *argue* first and then they *act*. Each action is a translation of an argument people will hold in their minds. Therefore, our following research will focus on applying prevention in the field of argumentation.

[1] https://medium.com/@vkhosla/reinventing-societal-infrastructure-with-technology-f71e0d4f2355