UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

TECHNOLOGY AND THE FUTURE OF ONLINE DISPUTE RESOLUTION (ODR)

PLATFORMS FOR CONSUMER PROTECTION AGENCIES

UNITED NATIONS
UNCTAD

This publication has been edited externally.

UNCTAD/TCS/DITC/INF/2023/5

ACKNOWLEDGEMENTS

This report was prepared by Mr. William Taborda, Information System Officer with the support of Ms. Ana Cipriano, Legal Officer, Mr. Arnau Izaguerri, Legal Officer and Ms. Valentina Rivas, Programme Management Officer, under the guidance and leadership of Ms. Teresa Moreira, Head of the Competition and Consumer Policies Branch, Division on International Trade and Commodities at UNCTAD. The author and UNCTAD thank: Mr. Federico Ast, Co-founder and CEO, Kleros.io; Mr. Pablo Cortés, Professor, Leicester Law School, University of Leicester; Mr. Biruh Mekonnen, Information Systems Officer, Lead Developer, International Trade Centre; Ms. Kruakae Pothong, Researcher, 5Rights Foundation and Visiting Research Fellow, London School of Economics and Political Science; Mr. César Useche, IT Services, SIC Facilita, Colombia; Mr. James Vasile, Partner, Electronic Frontier Foundation / Open Tech Strategies and Mr. David Zhang, China Silk Road Group Limited for their insights during the Second Digital Online Dispute Resolution training workshop on Consumer Dispute Resolution (CDR) – Technology (March 2022), of the technical cooperation project titled "Digital Trading Infrastructure and Online Dispute Resolution as mean to improve international trade and electronic commerce". UNCTAD thanks China Silk Road Group for providing financial support to the DODR Project, within which this report was undertaken.

TABLE OF CONTENTS

INTRODUCTION

In the age of rapid technological advancements, online dispute resolution (ODR) platforms have become increasingly vital for addressing consumer disputes effectively and efficiently. Consumer ODR consists of mechanisms for resolving disputes facilitated through the use of electronic communications and other information and communication technology.[1] Consumer ODR can take different forms, varying on the degree of automatization. The simplest ODR mechanisms replicate face-to-face mediation through electronic means, using written form, telephone or videoconferencing. Some software is able to facilitate negotiation through standardized communications that induce settlement. Finally, the most sophisticated and controversial ODR mechanisms deliver predictive justice in which the platform factors the parties' positions and interest using algorithms and, based on precedent, proposes a solution without human interaction. It is widely acknowledged that effective ODR systems are crucial tools for fostering consumer trust, safeguarding consumer rights, and promoting competitive markets in both national and regional economies.

The United Nations Guidelines for Consumer Protection (UNGCP),[2] endorsed by the United Nations Conference on Trade and Development (UNCTAD) and its Intergovernmental Group of Experts on Consumer Protection Law and Policy,[3] serve as a foundation for establishing consumer protection policies and promoting best practices globally. As noted in UNCTAD (2018: 2),[4] "The Guidelines are the only internationally agreed instrument on consumer protection, and have been widely implemented by UNCTAD member States." Guideline F of the UNGCP covering Dispute Resolution and Redress mentions access to dispute resolution and redress mechanisms, including alternative dispute resolution, should be enhanced, particularly in cross-border disputes. This is certainly relevant for electronic commerce: a consumer purchasing a good or a service online will expect an online avenue to resolve disputes with the business/provider. As discussed in the UNCTAD Research Paper on Consumer trust in the digital economy: The case online dispute resolution,[5] ODR is a core consumer protection mechanism that shows great promise for engendering trust if it can be effectively implemented.

Since 2020, UNCTAD has been working on a Technical Cooperation Project funded by the China Silk Road Group titled "Digital Trading Infrastructure and Online Dispute Resolution for Consumers as mean to improve international trade and electronic Commerce".[6] In the ambit of this project, UNCTAD conducted research to provide an updated picture of current global consumer online dispute resolution systems,

[1] A/CN.9/WG.III/XXXII/CRP.3 Available at: https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/acn9_wg.iii_xxxii_crp.3_e.pdf

[2] United Nations guidelines for consumer protection. Available at https://unctad.org/topic/competition-and-consumer-protection/un-guidelines-for-consumer-protection (accessed 21 March 2023).

[3] Intergovernmental Group of Experts on Consumer Protection Law and Policy https://unctad.org/topic/competition-and-consumer-protection/intergovernmental-group-of-experts-on-consumer-protection (accessed 21 March 2023).

[4] https://unctad.org/system/files/official-document/cicplpd11_en.pdf

[5] United Nations Guidelines for Consumer Protection (unctad.org)

[6] https://unctad.org/project/delivering-digital-trading-infrastructure-and-online-dispute-resolution-consumers-means

identifying best practices and lessons learnt. [7] In the course of this research, it became apparent that the existing systems run by consumer protection agencies from member States could be vastly improved with emerging technology. The research findings also revealed that in certain cases, like the Brazil's National Consumer Secretariat (SENACON), more than 90 percent of disputes are successfully resolved through online channels within 5 days and without the need for direct involvement from SENACON. This system not only saves valuable time to consumers but also saves State's resources.

This paper explores the impact of technology on the future of ODR platforms, particularly in relation to consumer protection agencies. By referencing the UNGCP and UNCTAD's expert group, we aim to provide insights into how emerging technologies can enhance ODR processes, better safeguard consumer rights, and ensure that consumer protection agencies can adapt and thrive in the ever-evolving digital landscape.

ODR implementations have made significant strides over the last decade, largely thanks to the increasing availability of technological tools such as affordable hardware, on-demand computer system resources (cloud computing), affordable video conferencing solutions, user-friendly electronic signature solutions, open-source tools and development frameworks. The practical impact of ODRs has also considerably improved as the percentage of the population using the internet [8] continues to rise and creates, together with adequate policy, a wider spread culture of online communication for public and private administrative procedures.

Despite these advancements, however, there is still much work to be done in terms of improving ODR systems. In the public sector, the implementation of ODR may still be lacking in terms of technological capacities, practical impact, interoperability of systems, scalability, automation, business intelligence, cost efficiency, and vendor independence, among other factors. These issues often arise from a combination of internal functional factors such as limited budgets, restrictive policies, overly complex operational workflows, lack of trained personnel, and resistance to change, as well as external factors such as language barriers and the increasing cost of software development.

It appears evident that the creation of ODR systems for a specific set of legislations is a balancing act of functional and policy constraints against budget among other factors (usability, reliability, performance, etc.). While policy and functional optimization are crucial to unlocking the potential of current technology in ODR projects, it is also worth examining the impact of emerging technologies in this field. These technologies may serve as cost reduction enablers and/or means to achieve specific objectives that are currently unfeasible with existing technology.

The Role of UNCTAD

To develop this collaborative solution, UN member States could utilize multilateral forums, such as the annual Intergovernmental Group of Experts on Consumer Protection Law and Policy hosted by UNCTAD, to encourage dialogue and cooperation among countries and consumer protection agencies. Working collectively, these agencies can identify common ground and build a solution that accommodates the needs of various countries and territories, ultimately creating a harmonized system that benefits everyone.

[7] The report will be published in the second half of 2023.

[8] ITU DataHub. Available at https://www.itu.int/net4/itu-d/icteye#/topics/2001 (accessed 21 March 2023).

It is important to recognize that UNCTAD is well-positioned to assist member states tackle the logistical and political challenges involved in creating a collaborative, open-source solution for ODR platforms. This can be accomplished through a variety of means, including providing technical assistance, facilitating discussions between countries and consumer protection agencies, and promoting public-private partnerships to support the development of necessary infrastructure and technology. Additionally, UNCTAD can potentially participate in the coordination of software development and management of open-source repositories, ensuring the open-source solution is regularly maintained and updated for long-term sustainability.

In summary, the future of ODR platforms for consumer protection agencies is promising, with numerous emerging technologies poised to enhance the efficiency and effectiveness of these systems. By collaborating, countries and their consumer protection agencies can create a shared solution that is both accessible and effective. However, it is crucial to collectively address the challenges and risks associated with implementing these technologies while ensuring that the systems are designed with end-users' needs in mind. This joint effort would not only help tackle challenges associated with implementing advanced ODR technologies but also foster cross-border cooperation, mutual understanding, and shared benefits among diverse regions and stakeholders. With such solutions in place, there is great potential for these platforms to positively impact consumers globally enabling swift and fair dispute resolution, regardless of geographic location.

Technologies for Consumer ODR

With the evolution of technology and its increased availability, the options available for the implementation of online dispute resolution platforms are also on the rise. Some of the most well-known emerging technologies potentially applicable to online dispute resolution platforms for consumer protection include the following:

- **Blockchain and Distributed Ledger Technologies (DTL)**
    - Blockchain technology can be used to create secure, transparent, and tamper-proof records of agreements and transactions. This can enhance trust between parties and facilitate the enforcement of resolutions, as well as reduce fraud and improve data security in ODR processes.
- **Artificial Intelligence (AI); and**
    - AI technologies, such as natural language processing and machine learning, can automate and streamline various aspects of ODR, including communication, document analysis, and decision-making. AI can also help identify patterns and trends in disputes, enabling faster and more accurate resolutions.
- **Chatbots**
    - Chatbots can help guide consumers through the ODR process by providing information, answering questions, and assisting with documentation. This can make the ODR process more accessible and user-friendly, reducing barriers to participation.

BLOCKCHAIN

Current State

Blockchain is an emerging technology that has garnered significant attention for its potential use in online dispute resolution (ODR) platforms. However, it is also one of the most controversial and least researched technologies in the ODR space, having been successfully implemented for the first time only in January 2009 for the creation of Bitcoin (the protocol).[9] At its core, blockchain is an open, public, distributed ledger that implements proof of work (PoW) consensus mechanisms, which use bitcoin (the token) for its economic incentive scheme. These features give Bitcoin its principal attributes, including decentralization, immutability, transparency, peer-to-peer (no intermediary), borderless, and permissionless access. Despite the potential advantages that blockchain offers for ODR, its implementation requires careful consideration and research, particularly as it relates to privacy, scalability, and accessibility.

Since Bitcoin's inception, many private and public organizations have created modified implementations of this blockchain by changing one or more characteristics or attributes in order to create networks for specific or general applications. Currently we count on thousands of distinct implementations, each with different degrees of openness, distribution, immutability, and accessibility. One of the main characteristics we have mentioned is the consensus mechanisms. The mechanisms [10] are the rules that define who is to take part in the consensus of data entry in the distributed ledger. As mentioned in the UN publication on "Blockchain for smart sustainable cities", "these rules ensure an agreement among participants on the validity of data insertion, the existence of a consistent set and guaranteed ordering of data to be stored in the distributed ledger. Usually, the consensus mechanism is adopted according to the type of blockchain being deployed, which defines who can join the network by setting up a copy of the database and its rights regarding reading and writing data to the ledger. It is possible to design a blockchain in which only some people or nodes can participate in the consensus mechanisms, and therefore only certain individuals/entities can validate the transactions".[11] However, it is important to note that there is a debate about whether blockchains that restrict participation to certain people or nodes can be considered true blockchains. In these cases, the more appropriate term to use may be distributed ledger technology (DLT), which in practice can be called a classic distributed system in contrast with blockchain. It is possible to design a DLT where only certain individuals or entities can participate in the consensus mechanisms and validate transactions, with or without utilizing technology derived from blockchain.

[9] YNakamoto S (2008). Bitcoin: A Peer-to-Peer Electronic Cash System. Paper available at https://bitcoin.org/bitcoin.pdf

[10] Some of these mechanisms include: Proof-of-work (PoW), Proof-of-stake (PoS), Proof-of-ownership (PoO), Proof-of-permission (PoP), Delegated proof-of-stake (DPoS), Practical Byzantine fault tolerance (PBFT), Federated Byzantine Agreement (FBA), Proof-of-capacity (PoC), Proof-of-activity (PoA), Proof-of-publication (PoP), Proof-of-retrievability (PoR), Proof-of-importance (PoI), Proof-of-burn (PoB), Proof-of-elapsed time (PoET), Direct Acyclic Graphs (DAGs).

[11] Ben Dhaou S et al (2020). U4SSC: Blockchain for smart sustainable cities. ITU. Page 18; referencing Nascimento S (2019), Pólvora A (ed), Anderberg A, Andonova E, Bellia M, Calès L, Inamoratodos Santos A, Kounelis I, Nai Fovino I, Petracco Giudici M, Papanagiotou E, Sobolewski M, Rossetti F, Spirito L. Blockchain Now And Tomorrow: Assessing Multidimensional Impacts of Distributed Ledger Technologies. EUR 29813 EN. Publications Office of the European Union. Luxembourg.

Role in Enhancing Consumer ODR

Among the thousands of distinct blockchains in existence, some have a broad enough scope of utility to enable the distributed execution of programming languages (code). In this case, a specific blockchain network of thousands of nodes acts like a single server for running software. However, it is important to note that the level of difficulty in modifying the code and rules of the software depends on the specific characteristics of the blockchain implementation. Only Certain blockchains that are truly decentralized and implemented in a way that avoids centralization of validation, replication of data, and other important functions of a blockchain are very hard to modify once the software is uploaded and running on the network.

These software applications executed in a distributed manner are known as smart contracts. Smart contracts can automatically perform data verification processes and execute instructions based on the retrieved data. Instructions such as disbursement of funds (usually paid in a specific blockchain token) and automated on-chain information access management, open a universe of potential applications including the facilitation and improvement of current ODR systems. Some of the most popular blockchains that allow for smart contracts are Bitcoin, Ethereum,[12] Cardano,[13] Solana [14] and Polkadot [15] (in order of current market capitalization).[16]
The immutability and transparency of blockchain technology make it an attractive option for ODR systems. By leveraging smart contracts, ODR systems can automate the resolution of disputes and facilitate secure, trustless transactions between parties. For instance, a smart contract could be used to automatically disburse funds to a consumer once a dispute has been resolved. Additionally, the distributed nature of blockchain technology can improve the accessibility and scalability of ODR systems, making it possible to handle a higher volume of disputes with fewer resources.

However, the implementation of blockchain technology in ODR systems also presents challenges and risks, such as:

- Potential for legal and regulatory barriers:
    - Implementing blockchain technology in ODR systems might face legal and regulatory challenges, as the technology is still relatively new and may not be covered explicitly by existing regulations. In some jurisdictions, the legal status of smart contracts and blockchain-based transactions remains unclear, potentially leading to disputes about their enforceability. Moreover, cross-border disputes may further complicate the legal landscape, as different countries may have varying regulations and approaches to blockchain technology. To address these challenges, it is essential to involve legal experts and work closely with regulators to develop a clear understanding of the applicable legal and regulatory frameworks and ensure compliance.

[12] Buterin V (2013). Ethereum Whitepaper. Available at: Ethereum Whitepaper | ethereum.org
[13] Hoskinson C. Why Cardano. IOHK 2015 – 2021. Available at Motivation (cardano.org)

[14] Yakovenko A. Solana: A newarchitecture for a high performance blockchain v0.8.13. Available at Solana: A new architecture for a high performance blockchain

[15] Wood G. Polkadot: Vision for a Heterogeneous Multi-Chain Framework Draft 1. Available at PolkaDotPaper.pdf

[16] CoinMarketCap. See https://coinmarketcap.com/ (accessed on 16 October 2021).

- The need for specialized technical expertise:
    - Developing and implementing blockchain-based ODR solutions require a deep understanding of the underlying technology, as well as expertise in areas such as cryptography, distributed systems, and smart contract programming. This specialized knowledge may not be readily available within consumer agencies, necessitating the recruitment of skilled professionals or partnerships with external blockchain development teams. Furthermore, continuous training and education of personnel will be crucial to keep up with the rapid pace of technological advancements in the blockchain space.

- The risk of security vulnerabilities:
    - Blockchain technology is often praised for its security and immutability. However, as with any technology, it is not entirely immune to security vulnerabilities. Smart contracts, in particular, may be susceptible to programming errors or exploits, which could compromise the integrity of the ODR process. Ensuring the security of a blockchain-based ODR system requires rigorous testing and auditing of smart contracts, as well as adherence to best practices for secure development. Additionally, contingency plans should be in place to handle potential security breaches or incidents to minimize their impact on the ODR process.

In conclusion, addressing these challenges is crucial for the successful implementation of blockchain technology in ODR systems.

Case Studies, Future Opportunities, and Challenges

A relevant case study is the Kleros protocol.[17] Kleros is a decentralized decision protocol (a smart contract in itself) built on top of the Ethereum protocol intended to arbitrate disputes in every kind of contract. Kleros has created its own native token called Pinakion (PNK) as a means of economic incentive for "jurors" to be fair and honest in their decision-making. The premise of the system is that a potential juror stakes (blocks) an amount of PNK which makes them eligible to be selected to arbitrate a dispute.

When a dispute enters the network, the Kleros protocol randomly assigns the case to a set number of jurors who have previously staked PNK. The jurors analyze the case and cast a vote, in full anonymity. Only after all the votes have been cast does the network inform the user who submitted the case about the decision made. If previously requested by the parties in the dispute, the network then executes a given smart contract. Overall, Kleros is an innovative approach to ODR that utilizes blockchain technology to provide a decentralized and transparent dispute resolution process. The use of PNK as a means of incentivizing fair and honest decision-making by jurors adds an extra layer of security and accountability to the process.

Kleros can be considered a functioning distributed ODR in theory; however, its applicability beyond highly technical environments, and specifically in the consumer protection context, is yet to be fully tested and proven. Acquiring and using PNK tokens, Kleros' native token, requires a relatively elevated level of knowledge about manipulating cryptocurrencies. This can be a barrier of entry, particularly when compared with more accessible tokens such as BTC or ETH, which have a more developed technology services ecosystem built around them. As a result, the risks of financial loss remain elevated for potential users of PNK without the right level of technical education. The team behind the Kleros protocol is aware of these practical shortcomings and expressed their preference to keep running this innovative form of ODR with the limited number of users it currently has while the technology matures.

One potential application of the Kleros protocol is to provide a service for private companies who agree to use the network to settle any potential disputes with their customers. In this case, the private company would pay the associated fees and abide by the decision made by the network. This approach mitigates the risks we previously mentioned regarding the technical complexity for consumers when using the Kleros protocol, as the business would handle the complexities associated with PNK tokens and interacting with the network. Kleros' objective in this scenario is to offer companies a solution that strikes the right balance between lower cost and demonstrably more neutrality, compared to their current private settlement solutions. By using a decentralized platform such as Kleros, both parties can trust that the decision made is fair and unbiased.

[17] Lesaege C, George W, Ast F (2021. Kleros Long Paper v2.0.2. See https://kleros.io/yellowpaper.pdf (accessed on 16 October 2021).

This approach has the potential to significantly reduce the costs associated with dispute resolution for both consumers and companies, while also increasing the efficiency and transparency of the process.

Kleros is currently running a pilot project with a Colombian car insurance company to test the system's applicability in the context of consumer protection. The hope is that the project will demonstrate the system's effectiveness and encourage other companies to adopt it as a means of resolving disputes with their customers.[18]

While Kleros is a great example of how blockchain technology can be implemented in ODR, we won't be scrutinizing their specific economic incentive scheme as it is beyond the scope of this technology-focused paper. However, it is worth noting that new economic incentive schemes can be easily deployed on this or other future blockchain implementations once the technology is mature and stable. Additionally, since most blockchain projects, including Kleros, are open-source, they can be replicated, modified, and released (forked) in a simple and permissionless manner, enabling a fast pace of innovation.

It is also important to highlight that Kleros is not the only project in this area. Other projects with similar economic incentive structures include the Aragon Network.[19] This is, however, a project with a broader scope since its focus is on facilitating the creation of Decentralized Autonomous Organizations (DAOs) with governance plugins.[20] The plugin or component on dispute resolution is therefore merely a part of a bigger project while Kleros defines itself mainly as a decentralized arbitration service.[21]

[18] Gonçalves, Erica. 2023. Kleros, la empresa del mundo cripto que resuelve conflictos comerciales tradicionales. La Nación. Accessed March 10, 2023. https://www.lanacion.com.ar/economia/negocios/kleros-la-empresa-del-mundo-cripto-que-resuelve-conflictos-comerciales-tradicionales-nid27022023/.

[19] Cuende L et al (2019). Aragon Network whitepaper. See https://github.com/aragon/whitepaper/ (accessed on 19 October 2021).

[20] MAragon (2021). See https://aragon.org/ (accessed 19 October 2021).

[21] Kleros (2021). See https://kleros.io/ (accessed 19 October 2021).

ARTIFICIAL INTELLIGENCE

Current State

Artificial intelligence (AI) is a vast and complex field. One of the core objectives of AI is to emulate human cognitive and decision-making capacities for problem-solving. Many AI projects aim to solve problems that require specific levels and applications of human intelligence. This makes AI applicable in any environment or subject matter where human discernment is required. It is worth noting that the Dartmouth Summer Research Project on Artificial Intelligence,[22] which took place in 1956, is often regarded as the birth of AI as a formal academic discipline.

In the context of ODR, the potential applicability of AI is significant, particularly for solving current issues such as the lack of human resources for non-easily automated tasks. AI technologies can automate repetitive and predictable tasks, freeing up human resources to focus on more complex and nuanced issues. Additionally, AI can assist in analyzing large amounts of data to identify patterns and trends, providing valuable insights that can inform decision-making in dispute resolution processes.

However, it is essential to acknowledge the challenges and risks associated with its use, which are not exclusive to ODR implementation. Issues such as potential biases in AI algorithms and concerns regarding transparency and accountability are common across various applications of AI. Consequently, careful consideration must be given to the development, implementation, and monitoring of AI solutions in ODR.

Specifically, for AI implementation in ODR, some challenges and risks may include:

- Ensuring privacy and data security: ODR platforms often handle sensitive personal and financial information. AI systems must be designed to respect data privacy and comply with relevant regulations, such as the GDPR.
- Balancing automation and human intervention: Over-reliance on AI may lead to overlooking important nuances in disputes that require human understanding and empathy. Striking the right balance between AI-powered automation and human involvement is crucial to maintain fairness and effectiveness in the resolution process.
- Ethical considerations: The use of AI in ODR may raise ethical concerns related to fairness, bias, and the potential for unequal access to justice. These concerns need to be addressed through ongoing evaluation and refinement of AI systems in the context of ODR.

By acknowledging and addressing these challenges, it becomes possible to harness the potential of AI in ODR while mitigating potential risks and maintaining a fair, reliable and effective dispute resolution process.Given the challenges and risks associated with AI implementation in ODR, as previously discussed,

[22] Artificial Intelligence Coined at Dartmouth Available at https://home.dartmouth.edu/about/artificial-intelligence-ai-coined-dartmouth (accessed 21 March 2023).

a thoughtful approach to development, implementation, configuration, and training becomes essential for enhancing fairness, reliability, and effectiveness. This process may involve, among other aspects:

- Data curation and analysis:
    - Collecting and organizing data: This process begins with gathering a diverse and representative dataset containing information on past disputes, resolutions, and other relevant factors. This dataset should be comprehensive, encompassing a wide range of dispute types, resolutions, and demographic profiles.
    - Data preprocessing: Data should be cleaned, structured, and standardized to ensure that the AI algorithms can accurately analyze it. This may involve handling missing values, transforming data into suitable formats, and removing duplicate or irrelevant data.
    - Exploratory data analysis: By visualizing and summarizing the data, researchers can identify trends, patterns, and potential relationships between variables. This step aids in understanding the underlying structure of the data, which helps inform the development of AI models.
- Addressing potential biases:
    - Identifying biases: Analyzing the dataset to identify potential biases is crucial for ensuring that AI algorithms do not perpetuate unfair outcomes. These biases may arise from sampling, measurement, or representation errors.
    - Mitigating biases: Researchers can employ techniques such as re-sampling, re-weighting, or using fairness-aware machine learning algorithms to reduce bias in the data and models. Furthermore, they should ensure that the AI system incorporates diverse perspectives by involving stakeholders with different backgrounds during its development and evaluation.
    - Monitoring for biases: Regularly evaluating the AI system's performance against fairness metrics is essential to ensure that biases do not emerge as the system evolves over time.
- Fine-tuning algorithms:
    - Model selection and training: Researchers should choose appropriate machine learning models based on the specific requirements of ODR, considering factors such as interpretability, complexity, and performance. The selected models should then be trained on the curated dataset to learn patterns and relationships within the data.
    - Model evaluation and validation: The trained models must be evaluated using appropriate metrics to determine their accuracy, fairness, and generalizability. Cross-validation techniques can be used to assess the model's performance on unseen data and ensure that it does not overfit the training data.
    - Hyperparameter optimization: Fine-tuning the model's hyperparameters can improve its performance and make it better suited for the ODR context. Researchers can use techniques such as grid search or Bayesian optimization to find the optimal set of hyperparameters for the specific problem.

Moreover, striking the right balance between AI-powered automation and human involvement is crucial for maintaining fairness and effectiveness in the resolution process.

Collaboration between AI experts, legal professionals, and consumer protection agencies is vital for designing AI systems that cater to the unique requirements of ODR and address concerns such as privacy, data security, and ethical considerations. By establishing multidisciplinary teams, holding regular meetings and workshops, conducting joint research and development, and creating guidelines and best practices, stakeholders can effectively work together to develop and refine AI-powered ODR systems. Additionally, through pilot projects, testing, and continuous feedback, these systems can be adapted to the evolving nature of disputes and the legal landscape. By acknowledging and addressing challenges through collaborative efforts and ongoing monitoring, it becomes possible to harness the potential of AI in ODR while mitigating potential risks.

Role in Enhancing Consumer ODR

The rapid advances in translation and interpretation-oriented AI solutions have made language barriers less significant in both personal and business environments. Many ODR systems currently implement automated translation services to translate both static and dynamic written content. These services are rarely completely accurate due to the nuanced complexity of all translatable languages. However, current state-of-the-art automated translation AI service platforms are more than capable of enabling the interaction of consumers with ODR systems that have been designed with predefined text options as a means of user input. Standardizing the input also helps translators to be more efficient. To achieve this, ODR systems minimize the use of open text fields where users are allowed to input long narratives. This approach aims to avoid input errors such as spelling, punctuation, grammar, and usage.

Some of the most popular providers of automated AI translation are DeepL, Google, Microsoft and Lengoo.

The use of automated translation AI solutions in ODR systems can greatly improve accessibility and user experience, allowing consumers who speak different languages to effectively use the same ODR platform. This is especially important in cross-border dispute resolution cases, where parties may speak different languages and have different legal systems. Automated translation AI solutions can help to bridge these language barriers and enable parties to communicate and understand each other more effectively. However, as with any AI solution, there is always the possibility of errors, especially when dealing with complex and nuanced languages. As such, it's important to use these solutions in conjunction with human review and oversight to ensure the accuracy and fairness of the system.

Other potential applications of AI in ODR systems include using machine learning and predictive analytics to analyze past dispute resolution data. By analyzing large datasets of past disputes, AI algorithms can be trained to identify patterns, predict likely outcomes, and inform the development of more effective dispute resolution strategies in the future. For example, by analyzing data on past cases, an AI algorithm could learn which types of disputes are most likely to escalate into formal legal proceedings, which parties are most likely to settle, and which resolution strategies are most effective in different types of disputes.

Based on these patterns and predictions, AI algorithms can help to develop more effective dispute resolution strategies for future cases. For example, an AI system could recommend certain dispute resolution processes or techniques based on the specific details of a case, such as the type of dispute, the

parties involved, and the desired outcome.

AI algorithms can be used to predict likely outcomes of disputes based on past cases with similar characteristics. For example, an AI system could predict the likelihood of a particular dispute being settled out of court, or the likelihood of a particular party winning a case if it goes to trial. This information can be used to inform negotiation and settlement strategies, and help parties to make more informed decisions about how to resolve their disputes.

Additionally, AI can automate case management processes and reduce the workload of human case managers, increasing the speed and accuracy of case processing. For example, AI can be used to automate routine case management tasks such as scheduling meetings, sending reminders, and updating case information. This can help to reduce the workload of human case managers and ensure that cases are processed quickly and accurately.

Furthermore, AI can be used to manage communication between parties involved in a dispute. It can automatically send and receive messages, translate messages into different languages, and provide real-time notifications. By handling communication, AI can help to reduce the workload of human case managers and ensure that communication between parties is efficient and effective.

Case Studies, Future Opportunities, and Challenges

Currently available automated translation platforms can be utilized to translate long text inputs by users in real time, including chat communication between two or more parties, making them extremely useful for existing and future ODR platforms during online conciliation, mediation, or arbitration processes. However, the quality of the communication is directly linked to the quality of the input, and this creates a number of issues that need to be considered by policy makers and ODR owners. These may include factors such as literacy rates, literacy levels, and the legal validity of automated translations, among others.

Moving to the next level of complexity, we have automated language interpretation of human speech in real-time. This application inherits all the challenges faced by the human text input use case mentioned before and adds the challenge of online human speech recognition. Automated language interpretation of human speech in real time over the internet entails many challenges to be overcome, such as the quality of analog to digital signal conversion, low signal-to-noise ratio, overlapping speech, homonyms, and variations in accents and dialects, among others. Additionally, the resulting text from speech recognition, in oral form, tends to differ significantly from a typical written form produced by a human. The implemented AI translation engine would need to be specifically configured and extensively trained for this purpose.

The inherent subjective nature and constant evolution of human languages makes for an extremely complex and ever evolving challenge. However, advancements in AI have given us exceptionally powerful and advanced translation implementations that are becoming increasingly cost-effective and easier to implement. When used in a well-designed manner, these tools can be extraordinarily helpful.

CHATBOTS

Current State

Chatbots can be described as a computer program designed to interact with humans using natural language, usually over the internet. As with any computer program, the definition and scope of applicability evolves alongside the underlying technology and related features.

At its simplest, a chatbot can be programmed with a set of pre-written responses to specific user inputs, using a rules-based approach. This means that the chatbot responds to a user's input by selecting an appropriate pre-written response from a database or set of options in response to a user's input, without using any AI techniques. However, as AI technologies have advanced, chatbots have become more sophisticated and able to handle a wider range of inputs and tasks. These chatbots may use natural language processing (NLP) algorithms to understand and interpret user inputs and machine learning techniques to improve their ability to respond accurately and appropriately over time. So, while chatbots may or may not involve the use of AI, the more advanced and capable chatbots often do rely on AI technologies to some extent.

While the term chatbot (chatterbot)[23] first appeared in 1994, chatbots technical implementations have been around since 1966 when Joseph Weizenbaum created ELIZA,[24] a script with a deterministic decision tree of answers related to keywords found in the human input. For the last 55 years, chatbot capacities have been advancing at a rapid pace given the vast complexity of solving natural language processing[25] challenges. These advancements have resulted in numerous open-source and commercial software applications for the implementation of chatbot solutions that vary in complexity, from very simple scripted deterministic solutions to very advanced artificial intelligence engines. However, the practical implementation of chatbots is often limited by technical capacities and budget constraints.

[23] Mauldin M (1994). CHATTERBOTs, TINYMUDs, and the Turing Test Entering the Loebner Prize Competition. Carnegie Mellon University Center for Machine Translation. Available at https://www.aaai.org/Papers/AAAI/1994/AAAI94-003.pdf

[24] Weizenbaum J (1966). ELIZA—a computer program for the study of natural language communication between man and machine. Communications of the ACM. Volume 9, Issue 1, 36–45. Available at https://dl.acm.org/doi/10.1145/365153.365168

[25] Manning C and Schütze H (1999). Foundations of Statistical Natural Language Processing, MIT Press. Cambridge, MA. Available at Foundations of Statistical Natural Language Processing (stanford.edu)

Role in Enhancing Consumer ODR

Several consumer protection agencies have expressed interest in integrating chatbot functionality into their existing ODR platforms. The goal of this integration is to minimize the workload on human resources while simultaneously improving the quality of attention and response time for end-users. Despite this interest, however, none of the agencies have confirmed the use of chatbots in their ODR platforms as of yet.

Chatbots can be used in ODR to provide users with automated assistance in navigating the dispute resolution process. Some potential applications of chatbots in ODR include:

1. Triage and classification: Chatbots can be used to pre-classify claims based on relevant regulations or policies, helping users to identify the appropriate dispute resolution process or institution for their complaint.

2. Information gathering and case initiation: Chatbots can be used to gather relevant information from users and initiate the dispute resolution process on their behalf.

3. Status updates and reminders: Chatbots can provide users with updates on the status of their case and send reminders about upcoming deadlines or required actions.

4. FAQ and self-help: Chatbots can be used to provide users with automated answers to frequently asked questions, as well as self-help resources such as videos, guides, or tutorials.

By automating these functions, chatbots can help to reduce the workload of human case managers and improve the speed and efficiency of the dispute resolution process. Additionally, chatbots can provide users with 24/7 access to dispute resolution information and support, improving overall accessibility and user experience.

However, it is important to ensure that chatbots are designed and implemented in a way that is user-friendly and transparent. Chatbots should be easy to use and provide clear and accurate information to users. Additionally, chatbots should be designed with user privacy and security in mind and should comply with relevant regulations and policies.

Overall, chatbots have the potential to significantly improve the effectiveness and accessibility of ODR systems for consumer protection agencies. By providing quick and efficient communication with consumers, chatbots can help to resolve disputes in a timely and cost-effective manner.

However, it is important to carefully consider the specific use cases of chatbots in ODR and ensure that they are implemented in a way that maximizes their benefits and minimizes any potential drawbacks. For example, chatbots may struggle to understand the nuances of legal language or complex disputes, leading to inaccurate or incomplete responses. Additionally, chatbots may lack the empathy and personal touch that can be important in resolving disputes, particularly those involving emotional or sensitive issues.

To address these potential drawbacks, it is important to use chatbots in conjunction with human review and oversight, particularly in high-stakes or complex cases. This can help to ensure that chatbot responses are accurate, appropriate, and empathetic, while also maximizing the efficiency and accessibility of the ODR system for consumers.

Case Studies, Future Opportunities, and Challenges

As mentioned earlier, chatbots can be useful in the context of ODR for interacting with end-users. One potential application is to use a chatbot to pre-classify or triage claims based on national or regional regulatory requirements. This can be especially helpful in territories where the dispute resolution system is complex and the division of competencies and interactions among institutions is difficult for end-users to navigate.

In some cases, a simple questionnaire with a series of multiple-choice questions could be sufficient for accurate claim classification. However, in other cases, a more advanced chatbot may be required. It is important to note that implementing and maintaining these chatbots requires technological capacities from the institutional side and may come at a cost. The practical efficiency and recommended use of such chatbots depend on several factors, including institutional budget and capacities, the complexity of the dispute resolution system and institutions involved, and the expected number of end-users. Careful assessment of these factors is essential before implementing a chatbot solution to ensure that it provides real value to end-users and is sustainable over time.

One interesting development in the field of chatbots for online dispute resolution systems is the use of application programming interfaces (APIs) of existing chat applications, such as ChatGPT. By leveraging these APIs, developers can integrate the natural language processing capabilities of advanced chatbots like ChatGPT into their systems, providing consumers with a more seamless and efficient dispute resolution experience. These chatbots can assist consumers in navigating complex legal jargon, providing information about their rights, and even mediating disputes between parties. By using these technologies, consumer protection agencies can provide more accessible and effective dispute resolution services to the public, ultimately fostering greater trust in the system and safeguarding consumer rights.

However, it is important to acknowledge that relying solely on technologies such as ChatGPT may also pose certain risks. While these chatbots are advanced and capable of processing natural language, they may not have been trained on specific consumer protections legislation for a particular country or region. As a result, they may provide inaccurate or incomplete information to consumers, leading to incorrect legal outcomes or other negative consequences. Therefore, it is crucial that developers and consumer protection agencies exercise caution when implementing chatbots and other technologies in their dispute resolution systems. They should ensure that the chatbot's knowledge base is properly trained and updated to reflect the current laws and regulations governing consumer protection in their respective jurisdictions. Additionally, it is important to provide consumers with access to human experts who can review and verify the accuracy of information provided by the chatbot, thereby mitigating potential risks and enhancing the overall effectiveness of the system.

CONCLUSION

The future of Online Dispute Resolution (ODR) platforms for consumer protection agencies is extremely promising, with a variety of new and emerging technologies that have the potential to enhance the efficiency and effectiveness of these systems. One major challenge for many countries is the lack of technological expertise and the necessary budget for implementing state-of-the-art ODR systems. In addition, some countries may also lack the legal framework necessary for the effective implementation of these technologies. These challenges can be particularly acute in regions where the dispute resolution system is complex and the division of powers and interactions among authorities is difficult for end-users to navigate.

Despite facing numerous challenges, a potential solution to address these issues would be a collaborative effort between United Nations member states and the private sector to develop an open-source software that is customizable to the specific needs of different countries and consumer protection agencies. The objective of creating this software would be to provide an easily adaptable, free ODR platform that could be implemented by various member states' consumer protection agencies. This would enable them to resolve disputes and protect consumers more effectively and efficiently.

By collaborating on the development of a shared solution, resource utilization can be optimized, ultimately leading to greater efficiency. This cooperative approach not only minimizes costs and time required for creating individual solutions but also promotes knowledge sharing and innovation. Consequently, the joint effort results in a robust and comprehensive solution that benefits all parties involved.

This ODR platform could be designed in a modular manner, allowing for the addition of new features in future releases to address the unique needs of individual countries. By sharing the effort and centralizing resource allocation for research and software development, the cost of developing and implementing advanced ODR technologies could be significantly lowered over time. Moreover, consumer protection agencies would reap the inherent benefits of open-source software (OSS) development processes and outcomes, such as transparency, community involvement, and reduced maintenance costs. Additionally, by establishing a shared framework and standards, this solution could provide some commonalities among systems, enabling interoperability for future cross-border cases and enhancing the accessibility and efficacy of ODR platforms globally.


Technology and the Future of Online Dispute Resolution (ODR) Platforms for Consumer Protection Agencies