



# A GUIDE TO BUILD A PRECEDENT SYSTEM FOR KLEROS

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## Abstract

This paper discusses the integration of a precedent system into Kleros. It addresses the necessity and implications of precedents in enhancing the effectiveness and reliability of this decentralized justice platform.

It is divided into 2 milestones: (i) The essentiality of precedents; and (ii) how can Kleros' precedent system be made.

Through comparative analysis of existing legal research tools like LexisNexis Shepard and Westlaw, the paper identifies key features that should be incorporated into the Kleros precedent system. These features include advanced search functionalities, AI-powered classification and keyword extraction, cross-referencing capabilities, and predictive analytics.

The paper advocates for the inclusion of all precedents within the Kleros platform to promote transparency and democratize access to legal knowledge.

Besides, the findings underscore the critical role of precedents in guiding jurors, ensuring consistency and predictability in rulings, and providing valuable insights for legal professionals and users. The implementation of a structured precedent system is presented as a pivotal step towards enhancing the operational efficiency and reliability of Kleros, positioning it as a leading platform in the realm of decentralized justice.



# Introduction

The appearance of Web3, characterized by its features of decentralization, transparency, and safety, has led many to aspire for an alternative way to resolve disputes; and that's when —2017— decentralized justice was born<sup>1</sup>. This alternative conflict resolution approach significantly reduces the time required for conflict resolution, contributing to a swift attainment of justice.

It offers a compelling alternative, presenting a path forward through the strategic application of game theory and Blockchain technology to specific cases.

This paper addresses the issue of including precedents on Kleros<sup>2</sup>, a decentralized justice system. Hence, I will assume the audience already knows how the platform works and what decentralized justice is<sup>3</sup>.

As part of the context it is also important to clarify that, at this date, there's a case database known as "[Klerosboard](#)". Nevertheless, this platform is not easy to navigate because it doesn't portray automatizations and a clear UX for juries, potential lawyers and investigators to navigate. The importance of these issues and the need for improvement are going to be developed throughout this paper, as well as detailed improvement proposals.

## a. Terminology and Context

### i. Precedents and leading cases

#### 1. *What is a precedent?*

Precedents in legal terms refer to the decisions of courts that are cited as an authority for deciding subsequent cases involving similar facts or legal issues<sup>4</sup>.

A precedent in the context of Kleros Court would refer to a prior case decision within the

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<sup>1</sup> AST, Federico, "The Kleros Vision", Kleros Blog, August 9, 2023. Retrieved on September 14, 2024 from <https://blog.kleros.io/the-kleros-vision/#:~:text=The%20Kleros%20Ecosystem%20in%202020,the%20world%20of%20technology%20evolved>.

<sup>2</sup> Kleros, <https://kleros.io/es/>

<sup>3</sup> In case you are not, then here's a paper where you can learn about this concept: AST, Federico, "When Online Dispute Resolution Meets Blockchain: The Birth of Decentralized Justice", Stanford Journal of Blockchain, law and policy, 2021, Retrieved on December 26, 2023.

<sup>4</sup> THOMSON REUTERS, "How to do legal research in 3 steps", October 2, 2023, Retrieved on January 4, 2024, from <https://legal.thomsonreuters.com/en/insights/articles/basics-of-legal-research-steps-to-follow>



same sub court that serves as a rule or guide for deciding subsequent cases involving similar facts or issues.

## 2. What is a leading case?

A leading case, as defined by the Cambridge Dictionary, is “a question or problem that is decided in a court of law, which is used as an example to decide similar cases”<sup>5</sup>

Initially, it is not easy to identify or succinctly define what qualifies as a leading case. Such a case must have significant influence in establishing a legal precedent within a specific field of law. “More important are the ‘**how**’ and ‘**why**’ questions: *How and why is the case now seen to be or to have been particularly significant*”<sup>6</sup>.

## b. Hypothesis and Research Questions

The key points that will be assessed throughout this paper are:

### A. The Need for Precedents

- a. Are precedents essential to the effective operation of Kleros, or can the system function optimally without them?

### B. How the precedent system can be made

- a. What features should the precedent system have?
- b. What key features should this precedent system have?

Thus, my research question is: *How essential are precedents to the effective operation of Kleros, and what mechanisms can be established to integrate precedents into the system to maximize its efficiency and reliability?*

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<sup>5</sup> CAMBRIDGE DICTIONARY, “Leading Case”, Retrieved on January 4, 2024 from <https://dictionary.cambridge.org/dictionary/english/leading-case?q=leading+cases>

Other possible definitions would be: (i) “a case that is regarded as having settled a particular point of law; a case that is used as guidance for legal decisions” (COLLINS DICTIONARY, “Leading Case”, Retrieved on January 4, 2024, from [More information can be found on: CRAWFORD, Allegra and LINCOLN, Laura, “What makes a ‘leading’ case?”, 2013, Retrieved on January 11, 2024 from <http://ssrn.com/abstract=2267158> at p.322.](https://www.collinsdictionary.com/dictionary/english/leading-case#:~:text=(%27li%CB%90d%20keys%20),Collins%20English%20Dictionary); (ii) The Butterworths New Zealand Law Dictionary succinctly defines a <i>leading case</i> as one that has had the greatest impact in establishing a specific legal precedent, earning recognition as an “authoritative statement of the governing principle” (SPILLER, Peter, “Butterworths New Zealand Law Dictionary”, 6th ed, LexisNexis, Wellington 2005 at p.168).</p></div><div data-bbox=)

<sup>6</sup> CRAWFORD, Allegra and LINCOLN, Laura, Op. Cit. at p. 336.



## 2. The Need for Precedents: Essentiality in Effective Kleros Operation

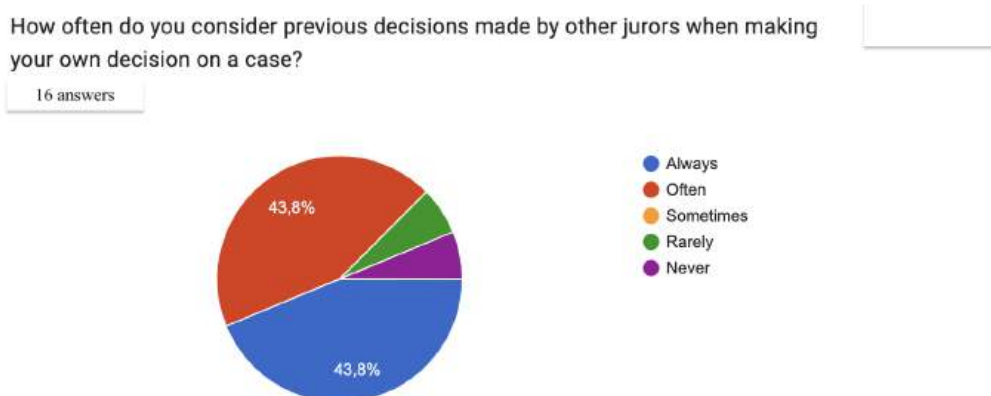
I will proceed to demonstrate why precedents are necessary for Kleros to function optimally and become a well known alternative dispute resolution system.

However, before doing so, it's important to clarify that, even though Kleros is not advertised as a precedent based system, jurors tend to check the previous rulings in similar cases, hence in practice referring to precedents<sup>7</sup>.

### a. Valuable guide for juries

Precedents play a pivotal role as a valuable guide for juries, offering insights into how analogous cases have been addressed, how evidence has been appreciated, and how decisions have been formulated.

In fact, I made a survey<sup>8</sup> among different juries in order to prove this hypothesis. This survey proved that 43,8% of the juries **ALWAYS** take precedents into consideration and that 43,8% **OFTEN** use them as well.



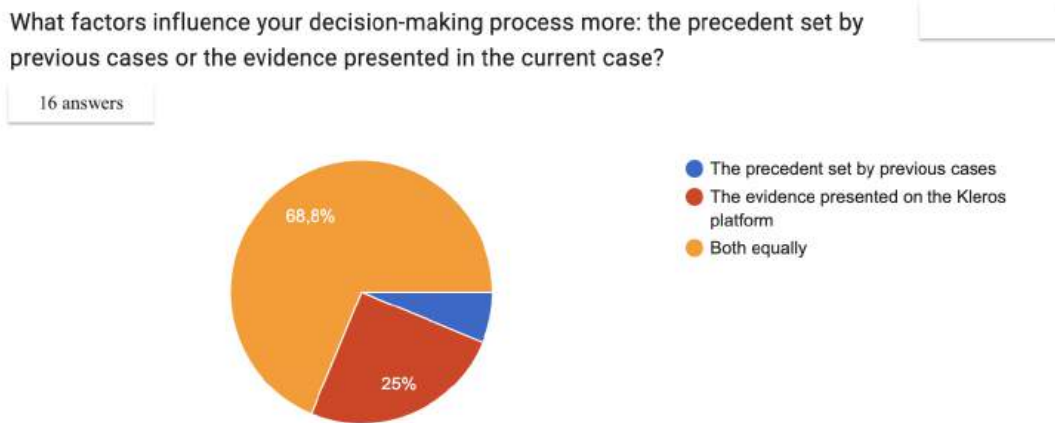
Graphic 1

<sup>7</sup> This is portrayed in the survey conducted and attached on the [Annex](#).

<sup>8</sup> This survey was created in order to get to know what the jurors that actively participate on the Kleros Telegram group. I got 16 responses from jurors. I believe that this number is enough because the pool of active jurors is small and because I wanted to get the perspective of the people that interact through the Kleros Telegram and actively participate in the community. The whole survey is displayed on the [Annex](#).



When asked how they reach the final decision, 68,8% stated they **EQUALLY** consider evidence and precedents.



Graphic 2

Let's take the "Doges on Trial" experiment as an example. This trial was made in order to test Kleros' cryptoeconomic incentives in a low-stakes environment. Launched in July 2018, it utilized Kleros' curated list application with the goal of gathering images of Doges, while Kleros was employed to resolve disputes over whether a submitted image qualified as a Doge, ensuring that non-Doge images were excluded from the list.

The key takeaway from the "Doges on Trial" experiment for this paper lies in the cases involving images of Doges and cats. In particular, most of the more recent cases were unanimously voted as "not Doge". This pattern shows that when jurors encountered potentially ambiguous situations, after a few early contentious cases, a form of precedent was established. As a result, submitters, challengers, and jurors can now reasonably predict how similar images will be judged in the future, demonstrating how the experiment fostered predictability in Kleros' decision-making process<sup>9</sup>.

The key takeaway from the "Doges on Trial" experiment for this paper lies in the cases involving images of Doges and cats. Initially, jurors were unsure of how to vote and there was general confusion about what constituted a Doge. However, after two or three cases were decided with the result of "not Doge", a clear pattern began to emerge. From that point onward, most of the more recent cases were unanimously voted as "not Doge". This pattern shows that when jurors encountered potentially ambiguous situations, after a few

<sup>9</sup> AST, Federico, BERGOLLA, Luis, BRAGA, Plinio, DEPLANO, Rossana, among other contributors, "Dispute Resolution: The Kleros Handbook of Decentralized Justice", p. 171. Retrieved on January 4, 2024, from <https://ipfs.kleros.io/ipfs/QmZeV32S2VoyUnqJsRRCh75F1fp2AeomVq2Ury2fTt9V4z/Dispute-Resolution-Kleros.pdf>



early contentious cases, a form of precedent was established<sup>10</sup>.

## b. Transparency

The reliance on precedents fosters transparency within this decentralized justice protocol.

This transparency aligns with the ethos of Web3, which emphasizes decentralization, openness, and trustless systems<sup>11</sup>. Web3 seeks to remove intermediaries and create systems where participants can independently verify processes. Leaving precedents out in the open makes Kleros trustworthy as users can check previous cases and understand how the process works.

Making an analogy, having precedents available is like blockchain explorers, there's a need to have those if we want every movement to be truly honest and straightforward.

## c. Risk Prevention and Strategic Planning

Having precedents on the Kleros Dapp provides a significant advantage in terms of risk prevention as it aids legal professionals, users and businesses in studying the dynamics of conflicts in the Web3 environment, offering valuable insights into how similar disputes have been resolved.

This knowledge becomes a cornerstone for the formulation of strategic approaches, enabling parties to prepare robust arguments and responses based on the outcomes of previous cases.

## d. Decision Trend Analysis and Statistical Insights

The presence of precedents enables users to gather statistical data on previous rulings, providing insights into the decision-making patterns of juries. By examining this data, users can discern trends related to the success rates of different types of cases and identify which classes of issues are more likely to result in successful outcomes.

This might also influence the game theoretic incentives as jurors may try to predict what the other jurors might say based on their prior decisions.

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<sup>10</sup> *Ibid.* P. 172.

<sup>11</sup> Here's more information about the connection between transparency and Blockchain: HAYES, Adam, "Blockchain Facts: What is it, how it works and how it can be used", December 15, 2023, retrieved on January 3rd, 2024 from: <https://www.investopedia.com/terms/b/blockchain.asp>





### e. Investigations

The presence of precedents offers users a valuable resource to investigate and comprehend the inner workings of decentralized justice.

These precedents provide invaluable insights into how disputes are assessed, deliberated, and ultimately resolved within a decentralized network of jurors. Examining past cases can reveal patterns, trends, and the evolution of decision-making processes, helping users gain a deeper understanding of the principles guiding decentralized justice.

### f. Improve Policy Making

The existence of precedents on the Kleros platform can significantly enhance the process of policy making. By leveraging a transparent and decentralized system for dispute resolution and decision-making, policymakers gain access to a wealth of past cases and rulings that offer valuable insights into legal and regulatory matters.

### g. Real-World Execution Alignment

The establishment of a precedent system on the Kleros Dapp provides a crucial advantage by fostering a connection with the 'real world' for the execution of sentences in subsequent trials. This is even more essential with the launch of Kleros Enterprise —"which seeks to implement Kleros' 'justice as a service' in institutions easily, without the complexities of dealing directly with cryptocurrency"<sup>12</sup>—, as this could foster future analysis of Kleros' resolutions on trial.

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<sup>12</sup> More information can be found on: AST, Federico, TROTZ Facundo and PERNAS, Marcos, "Kleros Enterprise: Dispute Resolution for Companies and Governments", Retrieved on June 20, 2024 from: <https://blog.kleros.io/kleros-enterprise/>



# 3. How can the Kleros system be developed and implemented?

## a. Comparative Research

Prior to delving into the integration of the precedent system within Kleros, it is necessary to conduct a comprehensive assessment of various legal research tools in order to identify and adopt the most advantageous features they offer. This insight could help Kleros leverage the experiences of others, as traditional legal tools have been in the market for years and have evolved to become more efficient and user-friendly for professionals.

In the following paragraphs, two of the most commonly used legal research tools are going to be analyzed <sup>13</sup>. These are: [LexisNexis Shepard](#) and [WestLaw](#).

In the third section, I will also cover Klerosboard, as it currently represents the closest equivalent to a precedent system within Kleros.

### i. LexisNexis Shepard

[LexisNexis Shepard](#) is a legal research tool widely used in the United States. Here's how it works:

- A. Citation Tracking:** Shepard's allows users to see how a particular case, statute, regulation, or legal issue has been cited in subsequent legal decisions. This is crucial for determining the precedent value of a case.

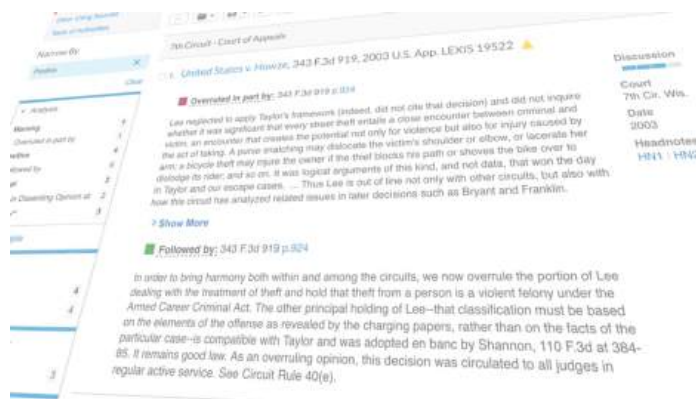


Image 1: LexisNexis Shepard <sup>14</sup>

<sup>13</sup> Other legal research tools are: Stretto, LaLey, Hammurabi, Erreius, among others.

<sup>14</sup> LexisNexis Shepard. Retrieved on January 10, 2024 from:

<https://www.lexisnexis.com/en-us/products/lexis/shepards.page>



- B. Analysis of Legal Authority:** The system analyzes whether a case has been followed, distinguished, questioned, or overruled in subsequent decisions. This helps in assessing the current validity of the case.
- C. Color-Coded Signal System:** Shepard's uses a color-coded system to indicate the treatment of a case. For example, a red flag might indicate that a case has been overruled, while a yellow flag might suggest caution as the case has received some negative treatment.



Image 2: LexisNexis Shepard<sup>15</sup>

- D. Comprehensive Coverage:** The system covers a wide range of legal sources, including cases, statutes, regulations, and secondary legal materials like law review articles.
- E. Integration with Legal Research:** Shepard's is often integrated with broader legal research platforms offered by LexisNexis, allowing users to seamlessly move between checking the authority of a case and conducting broader legal research.
- F. Updates and Alerts:** The tool provides updates on new case law and can alert users when the legal status of a case they are interested in changes.
- G. Historical Analysis:** It also allows for historical legal research, showing how legal interpretations and applications have evolved over time.
- H. User Interface and Accessibility:** Typically, Shepard's offers an intuitive interface where users can easily input case citations and receive comprehensive reports on

<sup>15</sup> LexisNexis, *Op. Cit.*



the case's treatment.

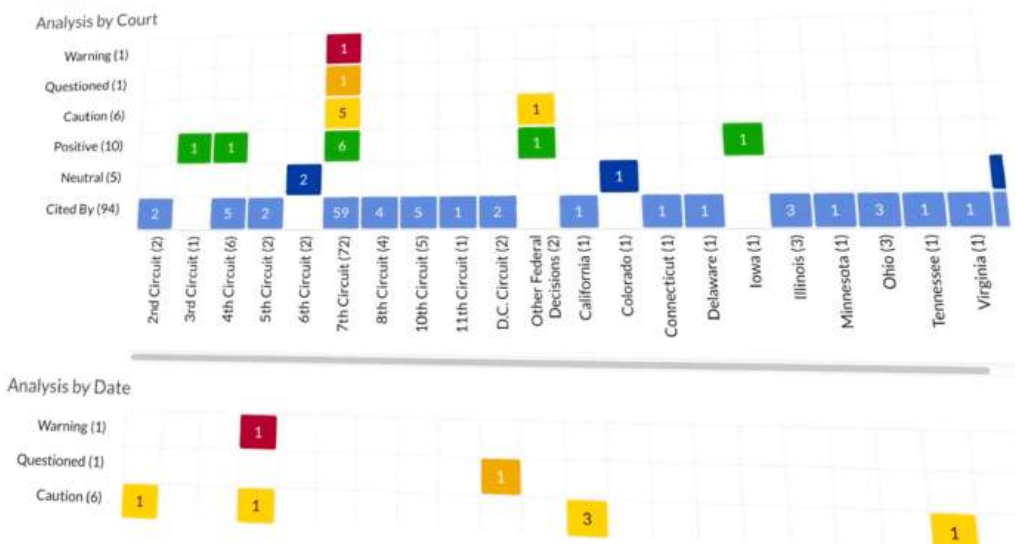


Image 3: LexisNexis Shepard<sup>16</sup>

ii. WestLaw

Westlaw is an online legal research service and proprietary database for lawyers and legal professionals available in over 60 countries<sup>17</sup>. Here's an overview of how it works:

- A. Comprehensive Legal Database:** Westlaw contains a vast collection of legal resources, including case law, statutes, regulations, legal journals, and more. It covers various jurisdictions, including federal and state levels in the U.S., as well as international law.

<sup>16</sup> LexisNexis Shepard. *Op. Cit.*

<sup>17</sup> WestLaw. Retrieved on January 10, 2024 from: <https://legal.thomsonreuters.com/en/westlaw>



Image 4: Westlaw<sup>18</sup>



Image 5: Westlaw<sup>19</sup>

**B. Search Functionality:** Users can search for legal documents using natural language or Boolean search queries. The system is designed to understand legal terminology and returns relevant results based on the query.

<sup>18</sup> WestLaw, *Op. Cit.*

<sup>19</sup> Ibid.



Westlaw UK

Insight Cases Legislation Journals Current Awareness

Cases

Home > Cases

Search

Free Text

Subject/Keyword

Party Names

Citation

Term Defined

Terms in Context

Search

[ Clear ]

Browse

Case Analysis Documents

Law Reports and Transcripts

Image 6: Westlaw<sup>20</sup>

- C. KeyCite System:** Similar to Shepard's in LexisNexis, Westlaw's KeyCite feature is a citation analysis tool. It helps users see how a particular legal case, statute, or regulation has been cited by other cases and whether it has been affirmed, reversed, or questioned.
- D. Secondary Sources:** Westlaw provides access to a wide range of secondary sources, such as legal encyclopedias, treatises, law review articles, and practice guides. These resources are helpful for understanding the context and application of the law.
- E. Customizable Alerts:** Users can set up alerts for specific cases, statutes, or topics, so they are notified when there are new developments or updates.
- F. User Interface and Accessibility:** The platform is designed to be user-friendly, with an intuitive interface that allows legal professionals to access information quickly and efficiently.

<sup>20</sup> WestLaw, *Op. Cit.*

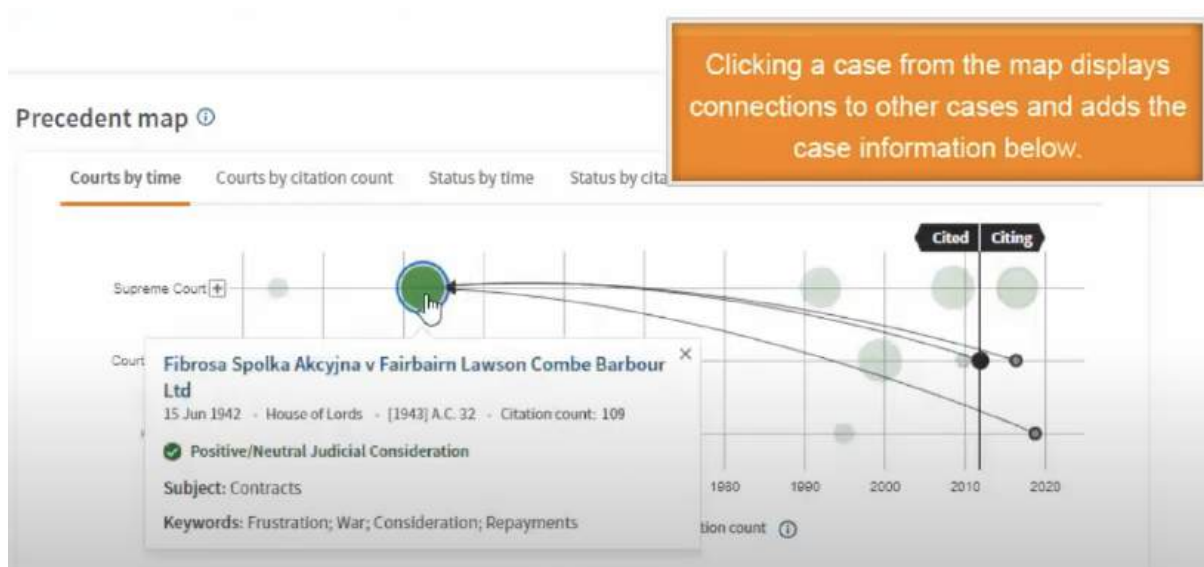


Image 7: Westlaw<sup>21</sup>.

**G. Personalization and Collaboration:** Users can personalize their experience on Westlaw, save searches, organize documents, and collaborate with colleagues.

### iii. Klerosboard

The [Klerosboard](#) is the most similar tool Kleros has to a precedent system. Thus, it's essential to analyze its key features, advantages and disadvantages.

**A. Disputes:** This section tracks ongoing and past disputes. It portrays a table of disputes within Kleros' courts, listing: (i) the dispute number, (ii) the court handling it, (iii) the current ruling status, (iv) the phase of the case (e.g., evidence, vote, execution), (v) and the date of the last period change.

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<sup>21</sup> Westlaw. *Op. Cit.*



### Disputes

Find all the cases created, its progress and stats.

#	Court	Current Ruling	Period	Last Period Change
#1647	Humanity Court	0	Evidence	September 11 2024, 0...
#1646	Humanity Court	0	Vote	September 11 2024, 1...
#1645	Humanity Court	0	Execution	September 4 2024, 19...
#1644	Humanity Court	0	Execution	May 2 2024, 08:50
#1643	Humanity Court	2	Execution	April 22 2024, 23:19
#1642	Humanity Court	2	Execution	April 13 2024, 09:07
#1641	Humanity Court	2	Execution	April 10 2024, 21:02
#1640	Humanity Court	0	Execution	March 24 2024, 23:06

Image 8: Dispute section on the Klerosboard

However, while the Klerosboard provides a compilation of these cases, one of its limitations is the lack of a search tool or keyword functionality. Without this feature, users must manually sift through the list, making it more challenging to quickly locate relevant disputes or patterns in rulings. Besides, users cannot filter disputes by court, specific dates, or other relevant criteria, making it difficult to efficiently locate specific cases or analyze trends. This absence of a more sophisticated search feature hinders its effectiveness as a tool for precedent-based decision-making and reference.

- B. Courts section:** The image shows the 'Courts' section on the Klerosboard, where various statistics about the courts are displayed. Each row provides information such as: (i) the court name, (ii) the total staked PNK tokens, (iii) the number of active jurors, (iv) the fee for jurors, (v) the minimum stake and vote stake, (vi) the total number of disputes, (vii) and any open disputes.





### Courts

Learn more about the courts, stakes, jurors and other stats

↑ Court Id	Court Name	Total Staked	Active Jurors	Fee for Jurors	Min Stake	Vote Stake	Total Disputes	Open Disput...
0	<a href="#">General Court</a>	190,415,12...	710	0.02	3,700	3,700 PNK	47	0
1	<a href="#">Blockchain</a>	16,120,358...	65	0.02	8,100	4,050 PNK	1	0
2	<a href="#">Non-Technical</a>	4,560,567 ...	49	0.02	13,000	5,070 PNK	363	0
3	<a href="#">Token Listing</a>	3,125,170 ...	7	0.062	36,000	18,000 PNK	15	0
4	<a href="#">Technical</a>	7,217,873 ...	14	0.037	22,000	11,000 PNK	29	0
5	<a href="#">Marketing Services</a>	520,281 PNK	15	0.1	14,000	4,550 PNK	1	0
6	<a href="#">English Language</a>	975,543 PNK	58	0.036	3,900	1,950 PNK	2	0

Image g: Courts section on the Klerosboard

Nevertheless, this section has the same limitation as the disputes section. There is no ability to search or filter the information by criteria like court name, number of disputes, or active jurors. This makes it difficult for users to navigate and analyze the data efficiently, as they have to manually go through the entire table to find specific information or detect patterns.

- C. General charts:** The image shows aggregated key performance indicators (KPIs) for Kleros Courts across all chains. At the top, the total number of PNK tokens staked is displayed (229,557,748 PNK), alongside fees paid (401.5788 ETH + 31,652.89 PNK), the total PNK redistributed (3,669,509 PNK), the number of active jurors (824), and the total number of cases (2,052).

Below these statistics is a graph showing the evolution of cases over time, tracking the number of cases in the Gnosis and Ethereum chains. The graph clearly shows a consistent upward trend in the total number of cases, starting from March 2019 and rising steadily until September 2024.



### Charts

Aggregated KPIs for Kleros Court in all it's chains



### Cases Evolution

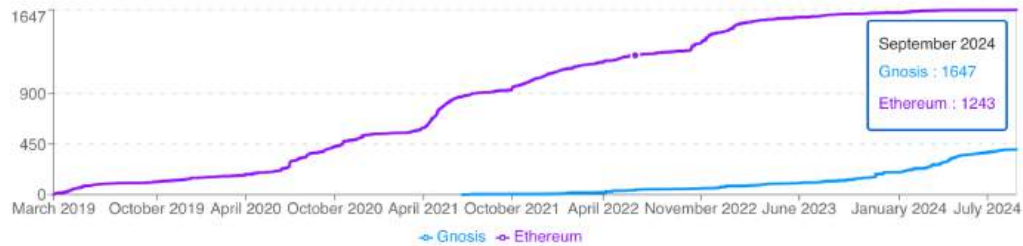


Image 10: General charts on the Klerosboard

Nonetheless, this chart lacks important details. It doesn't classify cases by court, nor does it show how many cases are handled by each court. It also doesn't provide approximate monthly breakdowns or deeper insights. While it's expected that case numbers will rise over time, the chart fails to answer key questions: Are certain courts growing faster than others? Are some courts becoming obsolete? Why are there shifts in case distribution across courts? All of this critical information is missing.

Moreover, the chart doesn't offer much interactivity, limiting the user's ability to explore data trends in a meaningful way, such as filtering by specific courts, comparing growth rates, or investigating why certain courts might be seeing more or fewer cases over time.

**D. Specific courts:** This section shows detailed statistics for each case. "Court #23: Humanity Court" will be used as an example to portray this section. The information includes metrics such as court coherency (88%) and the percentage of appealed cases (4%).

Other key data points include:

1. Minimum Stake: 10,000 PNK (USD 152.64).
2. Active Jurors: 128.
3. Total Cases: 1,013 (3 in the last 30 days).
4. ETH Paid to Jurors: 46.5349 ETH (USD 112,748.72).
5. Vote Stake: 5,000 PNK (USD 76.32)
6. PNK Staked: 5,322,418 PNK (USD 81,241.76).



- 7. Cases In Progress: 2 (none in the Appeal Phase).
- 8. PNK Redistributed: 302,877 PNK (USD 4,623.15).
- 9. Vote Reward: 0.02 ETH (USD 48.46).

At the bottom, there's a timeline showing the duration of different case periods: (i) Evidence Period: 6 days, 6 hours; (ii) Voting Period: 5 days, 1 hour, 30 minutes; (iii) Appeal Period: 3 days, 9 hours; and (iv) Enforcement: Final Decision.

### Court #23: Humanity Court

Breadcrumbs

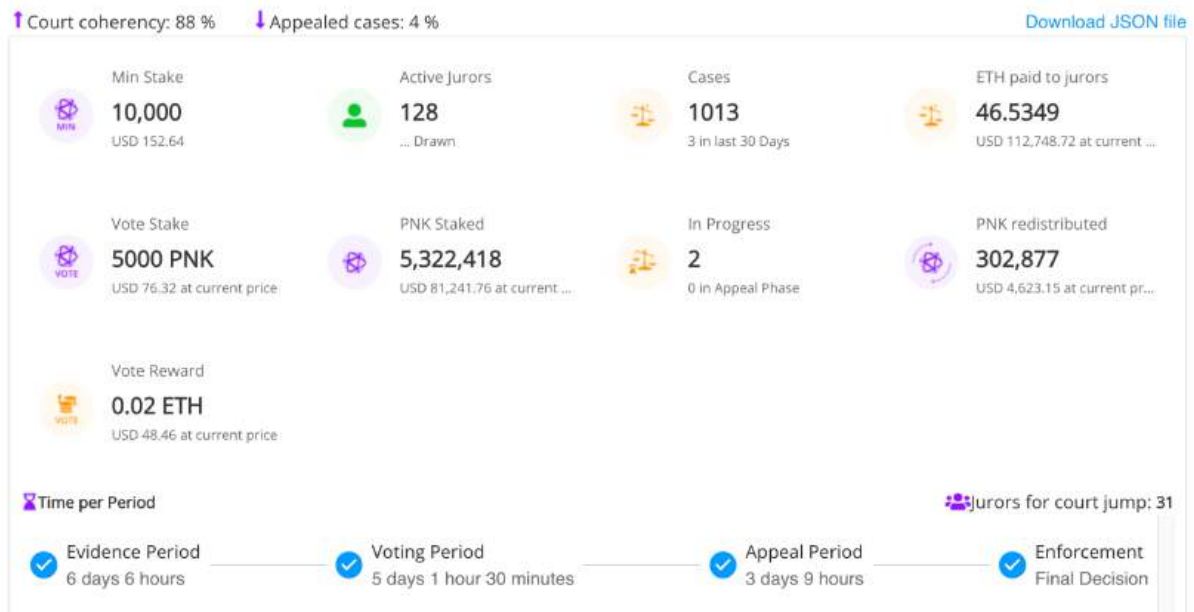


Image 11: Court #23: Humanity Court

While this dashboard provides useful information, it lacks interactivity. Users cannot easily access the evidence for specific cases; in some instances, access is available, while in others, it is not. It would be helpful to display the wallets of the jurors who participated in each case, as well as more detailed information about their decision-making patterns. For instance, showing how a juror typically rules across cases would add transparency to the process.

Moreover, a more detailed case timeline would improve user understanding of the case's progress. This could include key moments, delays, or comparisons with similar cases. Offering a comparative view of cases based on their similarities could further enhance analysis and precedent-building.



## b. Kleros Precedent System

### i. Should all precedents be included?

I believe that for the purpose of achieving all the benefits previously mentioned —valuable guide for new judges, transparency, risk prevention and strategic planning, decision trend analysis and statistical insights, investigations, improve policy making, and real-world execution alignment— there's a necessity to include all the precedents on the search tool.

By making all precedents accessible, Kleros democratizes legal knowledge. In traditional systems, access to comprehensive legal databases can be costly and restricted as professionals can only access a good jurisprudence system by paying a monthly fee on a specific platform. Kleros, in contrast, can offer open access to legal precedents.

Besides, the pseudonymity<sup>22</sup> of Web3 ensures that while cases and their outcomes are accessible, the identities of the parties involved remain protected. This aspect is crucial in maintaining privacy and aligns with the broader ethos of Web3, which values both transparency and individual privacy.

### ii. Features it should have

First of all, there should be a sub-section, both on the Kleros website and on the Kleros court, for juries and non-juries to search for these precedents.

The user journey would begin by clicking on the 'Precedents' Button.

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<sup>22</sup> Pseudonymity is the “near-anonymous state in which a user has a consistent identifier that is not their real name”. TECHTARGET, “Pseudonymity Definition”. Retrieved on January 11, 2024, from <https://www.techtargget.com/whatis/search/query?q=pseudonymity>



Image 12: Mock up <sup>23</sup>

This would take them to a separate section where the precedent search system would be available. There's the possibility to even filter among: "Topic", "Court", "Wallet" and "Date".



Image 13: Computer view <sup>24</sup>

<sup>23</sup> This is a mock up of what it can look like. In order to create it, I screenshotted the actual Kleros page (<https://kleros.io/es/>) and edited it.

<sup>24</sup> The picture was generated using ChatGPT's assistance.



Image 14: Mobile View <sup>25</sup>

In the following paragraphs, the specific characteristics this precedent system should have will be developed.

- A. Classification:** legal cases should be classified into specific categories or legal topics. In the case of Kleros, cases could be classified according to the sub court where they are being processed; this would be: Humanity Court, General Court, etc. This classification could be automatized through the usage of AI algorithms; however, it is not mandatory to use AI to do so and, at first, it might be better to create a simple database and iterate from there.
- B. Keyword Extraction<sup>26</sup>:** Key terms, phrases, and legal principles could be extracted from the cases. This can be immensely helpful for researchers looking to identify cases related to specific concepts or issues. Again, this can be automatized by using AI; however, it is not mandatory to use this technology. For instance, another possibility would be for jurors to provide 3 keywords they believe are related to

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<sup>25</sup> The picture was generated using ChatGPT's assistance.

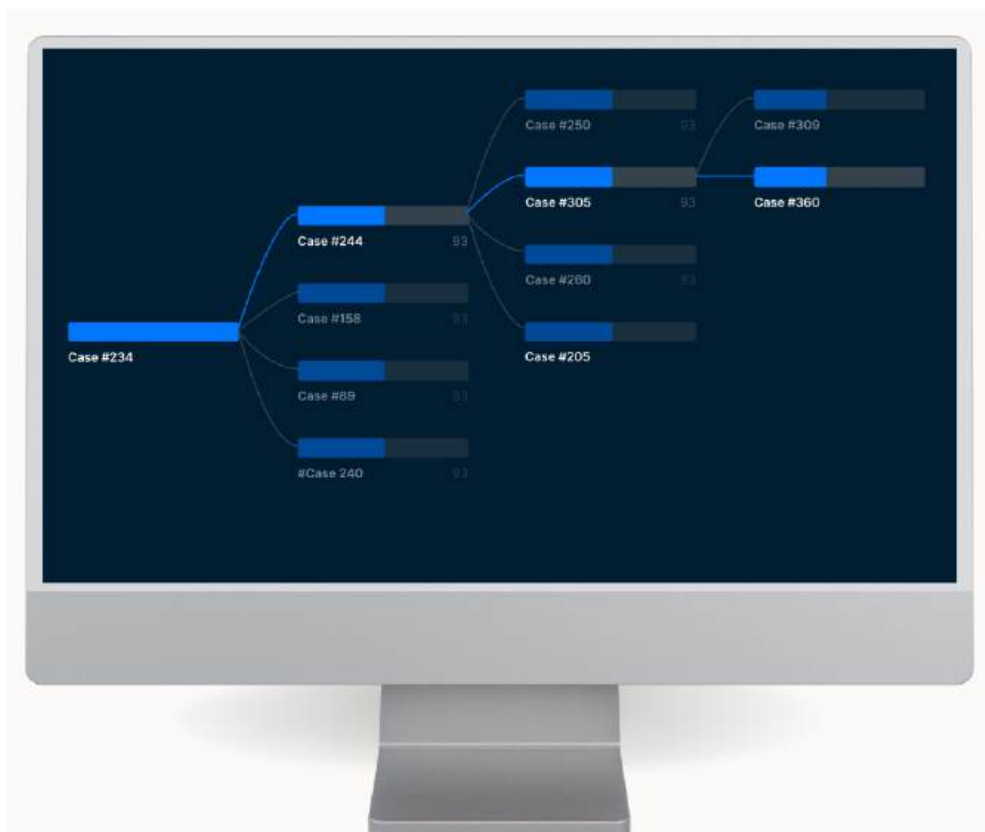
<sup>26</sup> As part of this investigation, I have discussed my proposal with some of the Kleros developers, such as Santiago Algozino, who told me that in order to carry this out all the evidence and cases should be stored on a database and then, with an Artificial Intelligence, the taglines and keyword extractions could be created.



the case when submitting their decision.

**C. Cross-Referencing and Similarity Detection<sup>27</sup>:** Identifying similarities between cases, would help researchers find relevant precedents more easily. Besides, cases could be cross-referenced to see how they have been cited in other cases, assisting in the analysis of the legal authority and influence of a particular case. In fact, as [Westlaw](#) does, a chart with similar cases could be made, where the leading case is highlighted and the remaining doctrines are portrayed.

- a. The following prototype was made to portray how this section could look like. The ones lightened are the cases that follow the same doctrine on the same sub court and are more related to each other, while the darker ones are cases related to the subject, but that either (i) didn't change the doctrine, or (ii) are still going through the process.



*Prototype 1: Crossreferencing*

**D. Visualization:** Visual representations, such as charts and graphs, can be made to

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<sup>27</sup> On this specific subject, Algozino stated it would be more complex to implement. Thus, we concluded this inclusion could be part of a 2nd phase. ALGOZINO, Santiago, *Op. Cit.*



illustrate decision trends and patterns. These visualizations make it easier for legal professionals and researchers to grasp and interpret the data. They could even be inspired by the graphs made on [LexisNexis Shepard](#) and [WestLaw](#).

- a. I made the following prototype to portray a graph with a color coded scheme that demonstrates the relation between different cases. The user experience would be the following: (i) Search for a specific subject, doctrine or case in all the sub courts; (ii) AI looks on the database and generates this bar graph; (iii) The violet portrays those cases following the same doctrine, while the yellow one portrays the cases that have overruled the one the user is looking for; lastly, the ones in light violet are the cases that are still ongoing.



Prototype 2: Color Coded scheme

- E. Content Summarization:** A concise summary of legal cases, highlighting key facts, issues, and decisions, can also be incorporated.
- F. G. Alerts:** When similar cases to those selected by users arise, they could be notified to keep them informed and up-to-date.

Besides creating an unique precedent page, a second face on this iterations could





consist on: (1) Using Big Data<sup>28</sup> to efficiently collect, organize and store the enormous volume of data daily generated on the Kleros' courts—including court records, evidence submissions, among others—; (2) Leveraging machine learning and natural language processing (NLP) algorithms in order to extract relevant information, as well as identify trends and patterns.

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<sup>28</sup> More information on Big Data: EASTWOOD, Matthew, VILLARDS, Richard & OLOFON, Carl, “Big Data: What it is and Why You Should Care”, June 2011, White paper, IDC, Retrieved on January 26, 2024; MANIKYA, J., CHUI, M., BROWN, B., BUGHIN, J., DOBBS, R., ROXBURGH, C., & HUNG BYERS, A., “Big data: The next frontier for innovation, competition, and productivity”, 2011, Retrieved on January 26, 2024; PENDE, H. E., “What is big data and why is it important?”, 2013, *Journal of Educational Technology Systems*, 43(2), 159-171, Retrieved on January 26, 2024.



## 4. Conclusion

The establishment of a structured precedent system within Kleros is imperative for enhancing the consistency, predictability, and reliability of its decentralized justice mechanism. The analysis presented in this paper underscores the indispensable role that precedents play in guiding jurors, ensuring transparency, facilitating strategic planning, and aligning the platform's operations with real-world legal practices.

By integrating a precedent system, Kleros can offer a robust framework for jurors, enabling them to make informed decisions based on historical cases. This system not only benefits new jurors by providing a valuable reference but also aids legal professionals and users in understanding decision trends.

The comparative analysis of existing legal research tools, such as LexisNexis Shepard and Westlaw, highlights the potential features that a Kleros precedent system should incorporate. These include advanced search functionalities, AI-powered classification and keyword extraction, cross-referencing capabilities, and predictive analytics. Such features will ensure that the system is user-friendly, efficient, and capable of handling the vast amount of data generated within the Kleros ecosystem.

Moreover, the proposal for the inclusion of all precedents, supported by a transparent and decentralized mechanism for selecting leading cases, aligns with the ethos of Web3, which values both transparency and privacy. By democratizing access to legal precedents, Kleros can position itself as a pioneering platform in the realm of decentralized justice, offering a level playing field for all users.

The implementation of this precedent system will not only enhance the operational efficiency of Kleros but also contribute to the broader goal of establishing a reliable and transparent decentralized justice system. It will serve as a testament to the potential of blockchain technology in revolutionizing legal processes, providing a compelling alternative to traditional dispute resolution mechanisms.

In summary, the integration of a precedent system is not just beneficial but essential for the effective operation of Kleros. It represents a significant step forward in the evolution of decentralized justice, ensuring that Kleros remains at the forefront of innovation in the legal domain.



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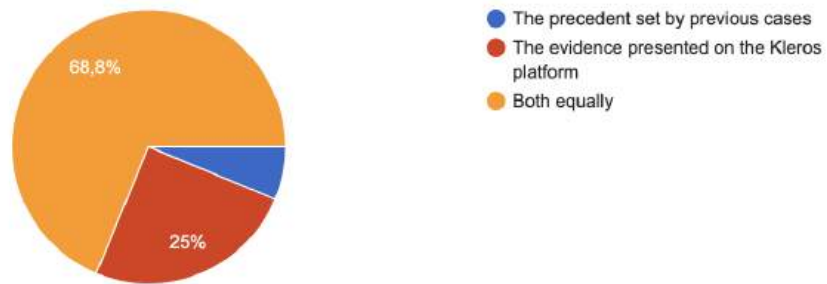
# 6. Annex

## a. Juries Survey

This survey was created in order to get to know what the jurors that actively participate on the Kleros Telegram group. The questions included on the survey were:  
I got 16 responses from jurors. I believe that this number is enough because the pool of active jurors is small and because I wanted to get the perspective of the people that interact through the Kleros Telegram and actively participate in the community.

What factors influence your decision-making process more: the precedent set by previous cases or the evidence presented in the current case?

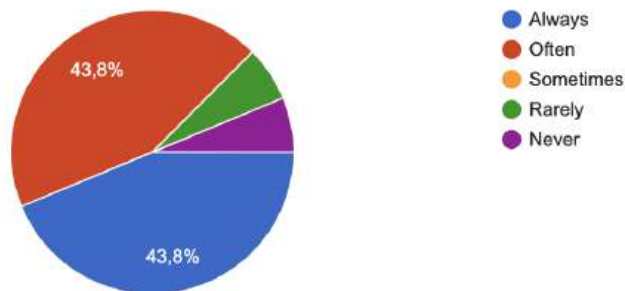
16 answers



Graphic 3: Question 1

How often do you consider previous decisions made by other jurors when making your own decision on a case?

16 answers

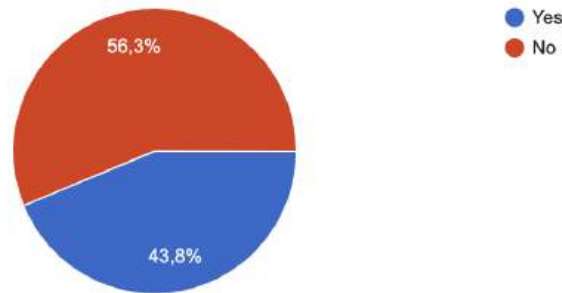


Graphic 3: Question 2



Are you used to talking about the cases on the Telegram group?

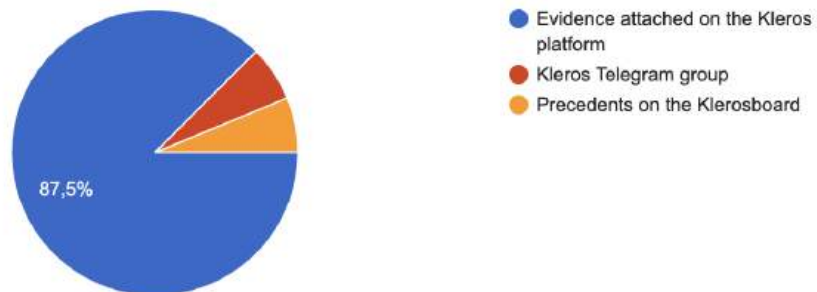
16 answers



Graphic 4: Question 3

When you get a new case, what do you look at first?

16 answers



Graphic 5: Question 4

Question 5: Can you walk me through the decision-making process?	
Answer 1	Evaluative deduction and induction combined with at times didactic assertion both justified by evidence and past precedence and in keeping with the juror guidelines
Answer 2	First evidence, then look for similar cases. If both decisions (evidence + precedent) are the same I have my final decision. If they are not the same, I look for other opinions (telegram group)



<i>Answer 3</i>	<ol style="list-style-type: none"> <li>1. Evidence + Independent research</li> <li>2. Precedent</li> <li>3. How other jurors will likely vote base on their voting history</li> </ol>
<i>Answer 4</i>	<p>Review the Dispute Policy  Review the evidence from all sides  Check Previous Cases</p>
<i>Answer 5</i>	Evaluative deduction and induction as well as prescriptive didactic assertion both justified by evidence and in conformity with the Kleros juror guidelines
<i>Answer 6</i>	Evidence on kleros dashboard – What others jurors decide
<i>Answer 7</i>	Each case is unique but sometimes there are very similar cases and created for the same reasons. In this case, the precedent is important because Kleros is still relatively small, there are the same jurors voting on it, which means that if a specific case had a certain verdict, then a following similar case is likely to have the same verdict, not always, but it is a good predictor. That's why you have to take everything into account, not only the context of the case, but all the context surrounding it, i.e. the jurors voting on it apart from you.
<i>Answer 8</i>	Look at the evidence, and promptly make a decision if there's a clear breach. If it's in the gray area, I will look at social media for signals. It's hard to look for precedence unless you are well versed in the specific court.
<i>Answer 9</i>	In the decision-making process, it is clear that based on the evidence presented by the parties, I made the decision based on finding the focal point. At some point in my jury experience, I had a case where there were many grays. , and I appealed to vote based on the values with which I was raised, and unfortunately it is one of the few cases in which I did not get the focal point right!!! In that case, I voted for what I believed should be... and not for what the evidence concretely and objectively indicated was the verdict... it served to learn for the future.
<i>Answer 10</i>	Know the policies, observe the evidence, remember precedents, analyze, vote
	First I see the evidence, then I review other similar cases (if any) and what was voted, finally I discuss in the telegram groups. From all that I get my decision.
<i>Answer 11</i>	<ol style="list-style-type: none"> <li>1 - go through the evidence.</li> <li>2 - check previous cases on Klerosboard</li> <li>3 - check dispute policy</li> </ol>
<i>Answer 12</i>	Study the case's policy and agreements; look at the evidence and context of the dispute; look for precedents or discussions around the dispute (unless the case's ruling seems obvious). If unsure, I might wait until the last





	voting day in case new arguments are presented by other jurors or parties involved in the dispute
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<b>Question 6: How do you think the introduction of a precedent system might impact the overall decision-making process within Kleros?</b>	
<i>Answer 1</i>	I think it would improve the overall decision-making process within Kleros
<i>Answer 2</i>	It will be different, but if there are rules to follow any system has its pros and cons
<i>Answer 3</i>	<p>I can see how a precedent system in Kleros could provide some consistency, but I have a few concerns about potential drawbacks:</p> <ol style="list-style-type: none"> <li>1. Previous decisions may have just been reached because a single juror had the majority vote in the first round, not necessarily because of a broader consensus.</li> <li>2. A really strict precedent system could make the whole process too rigid, limiting the ability to adapt and consider new circumstances.</li> <li>3. If those initial precedent-setting decisions were influenced by bias or incomplete information, then that could just perpetuate those issues over time.</li> </ol> <p>I think a more balanced approach, where precedents are considered but not treated as strictly binding, is better</p>
<i>Answer 4</i>	It would something interesting to analyze
<i>Answer 5</i>	Better
<i>Answer 6</i>	I'm not sure what you exactly mean by a precedent system, or how that would work. But sure it would impact in some way, maybe it contains valuable contextual information
<i>Answer 7</i>	It will immensely cut cost in decision making
<i>Answer 8</i>	I sincerely believe that a system of precedents can make everything become mathematical, and juries practically do not analyze the evidence. It can be used in cases where the resolution and the evidence indicate that it is either white or black, but many times there are grays, and the interpretations of the human beings who intervene as jurors are different, especially when it comes to different cultures that intervene, something you never know, because we don't know who is behind the wallets as jurors
<i>Answer 9</i>	There were cases in which, despite the fact that there was a precedent, a vote was taken differently. If the precedent is law, I estimate that people will always vote according to it
<i>Answer 10</i>	I think having a system of precedents will help the jurors and Kleros in



	general make better decisions
<i>Answer 11</i>	Will help totally but needs a good and smooth UX/UI
<i>Answer 12</i>	I don't know what 'the introduction of a precedent system' means. Jurors already base some decisions on precedents, which are proxies of juror consensus around certain arguments