

Service Offering

iLex

Increase the efficiency of
legal research leveraging AI



Legal tech – origin, reasons and impact

The greatest danger in times of turbulence is not the turbulence itself – it is to act with yesterday's logic

A blue banner with a circular graphic containing icons for a scale of justice, a book, and a group of people. A hand is shown holding a glowing sphere.

Rise of legal tech

Disruption of the legal practice

- Legal tech: application of technology and software to help simplify, optimize and automate their operations
- Usually associated with technology startups disrupting the practice of law

Legal Tech market growth

- Increase in legal services patent filings over the last five years
- Led by the US, China and South Korea; Europe is trying to catch up

High expectations

- 63% of surveyed participants anticipate that between 40% and 80% of their daily work will involve legal technology in the next five years

A banner with a blurred image of chess pieces on a board.

Why now?

Process efficiency through AI

- Leveraging AI has the potential to generate the same amount or even more revenue while expanding their client rosters
- Tech-savvy law firms make nearly 40% more in revenue than old-school ones

Meet client demands

- With clients demanding greater efficiencies and increasingly clamping down on legal fees
- Clients are increasingly cost-sensitive and want legal advice in real-time

Competitive pressure

- Firms too slow to adapt to AI and automation will suffer a competitive disadvantage

A banner with a green-tinted image of a hand holding a stack of papers.

AI will not replace layers

Emergence of the digital layer

- AI is not going to replace the need for critical thinking
- AI and automation tools will make the work of junior legal professionals and lawyers across the board more efficient and enable them to process more data much faster

Less manual work, more focus on added value

- The goal is to enable professionals to better use their judgment based on more comprehensive data insights
- The human judgment call remains a crucial element for any legal decision
- Professional lawyers have to use their intuition and their best judgment to understand the law

Legal tech solutions powered by AI

How AI driven solutions are already transforming the legal sector



Document analysis

Algorithm-based automation of legal document review and analysis tasks.

- Identify document structure
- Entity & relation extraction
- Domain-specific concept markers
- Deviation analysis



Legal research

AI powered legal research help layers to find relevant information faster, more efficiently and cost-effectively

- Discover, index & process legislations and articles
- Identify connections
- Derive how to apply the law



Today's focus



Contract Automation

Logic-based systems to automate the creation of legal documents

- Questionnaire led client information gathering
- Automated contract creation using templates and client details
- Specify optional language parts



Litigation analytics

Predict most probable outcome of case

- Evaluate your judge
- Manage client expectations (time, cost, ruling)
- Build winning strategy (e.g. find facts like granted motion per judge)



Legal research challenges

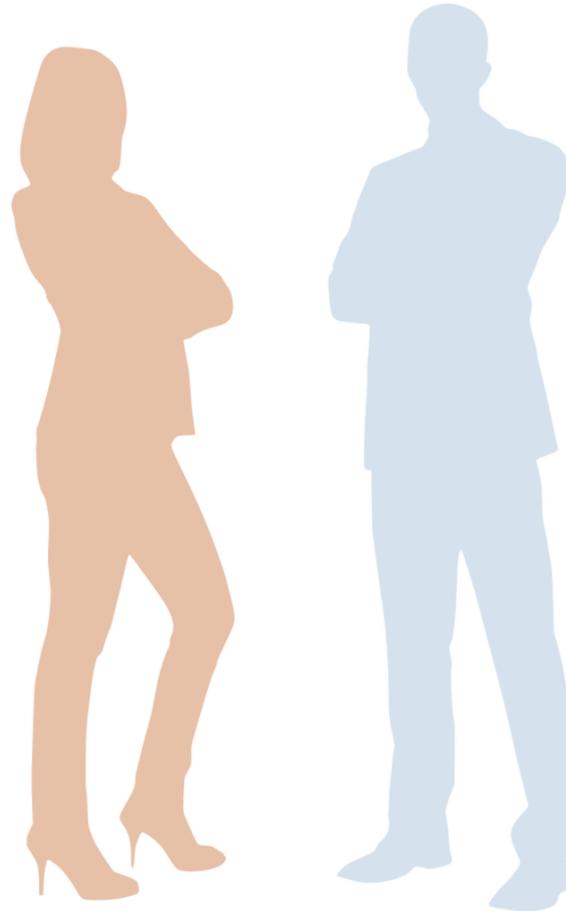
Legal research comprises multiple legal sources that must be identified and read in context with each other in an efficient way to interpret current cases correctly and come to a substantiated as well as timely solution

- Legal research is one of the most important aspects in legal practices, but also one of the most time consuming
- On average approx. **40%** of the time allocated for a case is spent researching:



■ Research ■ Draft ■ Revision

- Inefficient legal research can lead to frustration and insufficient statutory and case law
- Not enough time is spent to **add value** for the client (legal analysis, issue-spotting, and the application of law to facts)



Multitude of legislations

Multitude of relevant primary, secondary and tertiary legislations



Up to date versions

Application of latest legal text approved by regulators as well as consideration of previous iterations



Interpretation within context

Individual articles must be applied in the context of additional articles, having direct and indirect links between legislations



Specify correct search term

Identify correct keywords, search terms and keyword combinations



Prioritize search results

Identify most relevant and authoritative legislation and article within result list



Exhaustive search

Know when a search was exhaustive, and it is sufficient to stop



**Automated data scraping
and preprocessing pipelines
for regulatory sources**



**Leverage state of the art AI
algorithms to speed up your
research tasks**



**Intuitive user interface
enables efficient workflow
and in-depth analysis**

The image shows a laptop and a tablet displaying the Auctabis research interface. The laptop screen displays a search results page with a network graph and a table of articles. The tablet shows a search form and a detailed article view.

Search Results Table:

Article	Article Name	Legislation
5	Definitions specific to capital requirements for credit risk	CRR
264	Credit risk mitigation for securitisation positions subject to the IRB Approach	CRR
514	Counterparty Credit Risk and the Original Exposure Method	CRR
512	Exposures to transferred credit risk	CRR
453	Use of credit risk mitigation techniques	CRR
452	Use of the IRB Approach to credit risk	CRR
442	Credit risk adjustments	CRR
439	Exposure to counterparty credit risk	CRR

Article 5 - Definitions specific to capital requirements for credit risk

for the purposes of part three, title ii, the following definitions shall apply:

- (1) 'exposure' means an asset or off-balance sheet item;
- (2) 'loss' means economic loss, including material discount effects, and material direct and indirect costs associated with collecting on the instrument;
- (3) 'expected loss' or 'el' means the ratio of the amount expected to be lost on an exposure from a potential default of a counterparty or dilution over a one year period to the amount outstanding at default.

Article 264 - Credit risk mitigation for securitisation positions subject to the IRB Approach

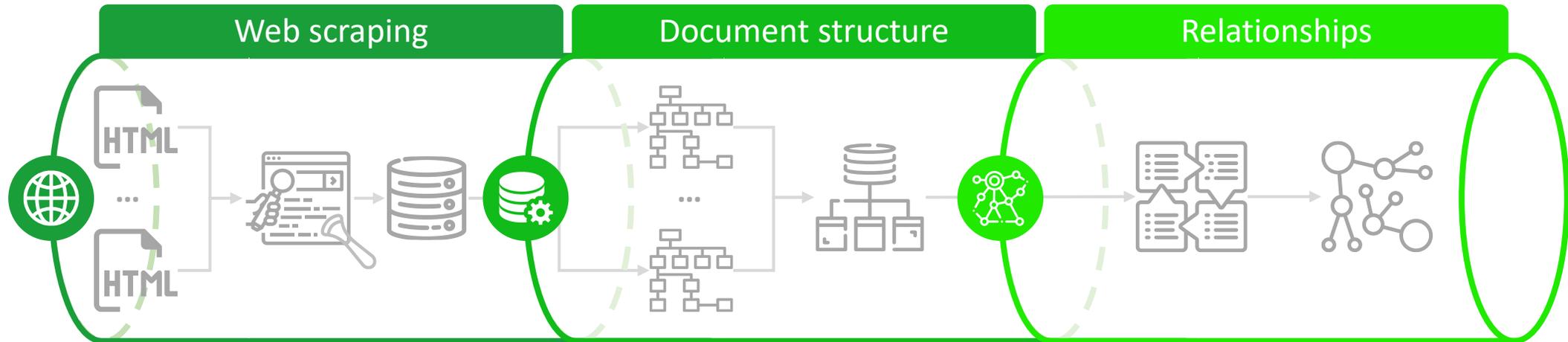
1. where risk-weighted exposure amounts are calculated using the ratings based method, the exposure value or the risk-weight for a securitisation position in respect of which credit protection has been obtained may be amended in accordance with the provisions of chapter 4 as they apply for the calculation of risk-weighted exposure amounts under chapter 2.
2. in the case of full credit protection, where risk-weighted exposure amounts are calculated using the supervisory formula method, the following requirements shall apply:
 - (a) the institution shall determine the 'effective risk weight' of the position. it shall do this by dividing the risk-weighted exposure amount of the position by the exposure value of the position and multiplying the result by 100;
 - (b) in the case of funded credit protection, the risk-weighted exposure amount of the securitisation position shall be calculated by multiplying the funded protection-adjusted exposure amount of the position (e^*), as calculated under

Tablet Search Results:

Legislation	Probability
CRR	0.802174
CRR	0.801523
CRR	0.801212
CRR	0.800690

Data sourcing and preprocessing

Fully automated data sourcing pipelines and a scalable data model enable fast integration of additional data sources as well as updates of existing sources when there is an update



Web scraping

- Automated download of regulatory sources (e.g. eur-lex.europa.eu)
- Convert raw html data in machine readable format to enable further processing
- Extraction of relevant data (meta data, law body, appendix)
- Storage of intermediate files for further processing (e.g. csv, DB, JSON)

Document structure

- Definition of regulatory document data model resp. taxonomy that can be used for further sources
- Identification of the legislations structure (part, title, chapter, etc.)
- Segmentation and extraction of articles as well as their reference
- Segmentation of articles into paragraphs, subparagraphs, etc.

- Identification links to other articles and legislations within each article
- Representation of articles and links in knowledge graph (nodes and relationships) to enable representation as well as visualization of an article's context
- Enables differentiation of inbound and outbound relationships

Improved legal research leveraging AI

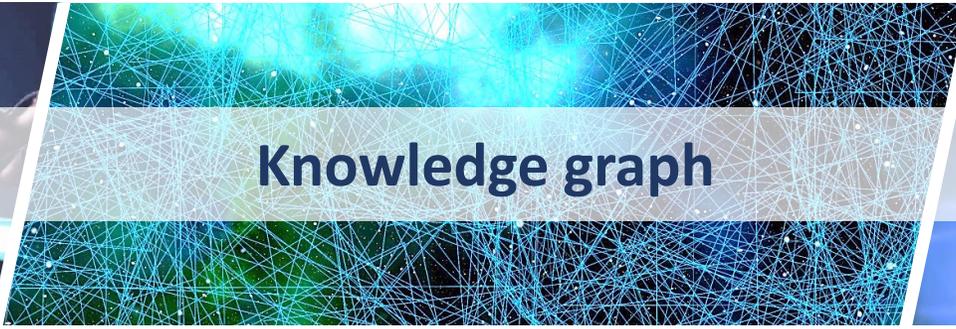
iLex leverages three data-driven algorithms and techniques to speed up legal research tasks



Boolean search

Discover set of relevant articles and subsequent refinement of the results

- Overlap of topics resp. keywords (e.g. risk) in articles
- Allows users to combine keywords with operators (or modifiers) such as AND, NOT and OR to further produce more relevant results
- Search within primary, secondary and tertiary legal sources (e.g. article name, text)
- Boolean search helps you to filter results of initial broader searches thus focusing your search while being exhaustive



Knowledge graph

Identify connections both in legislations and to other legislations

- Represents a collection of interlinked descriptions of entities – objects, events or concepts. Knowledge graphs put data in context via linking and semantic metadata and this way provide a framework for data integration, unification, analytics and sharing.
- Helps to understand the relationships between articles
- Knowledge Graph can help you make unexpected discoveries.



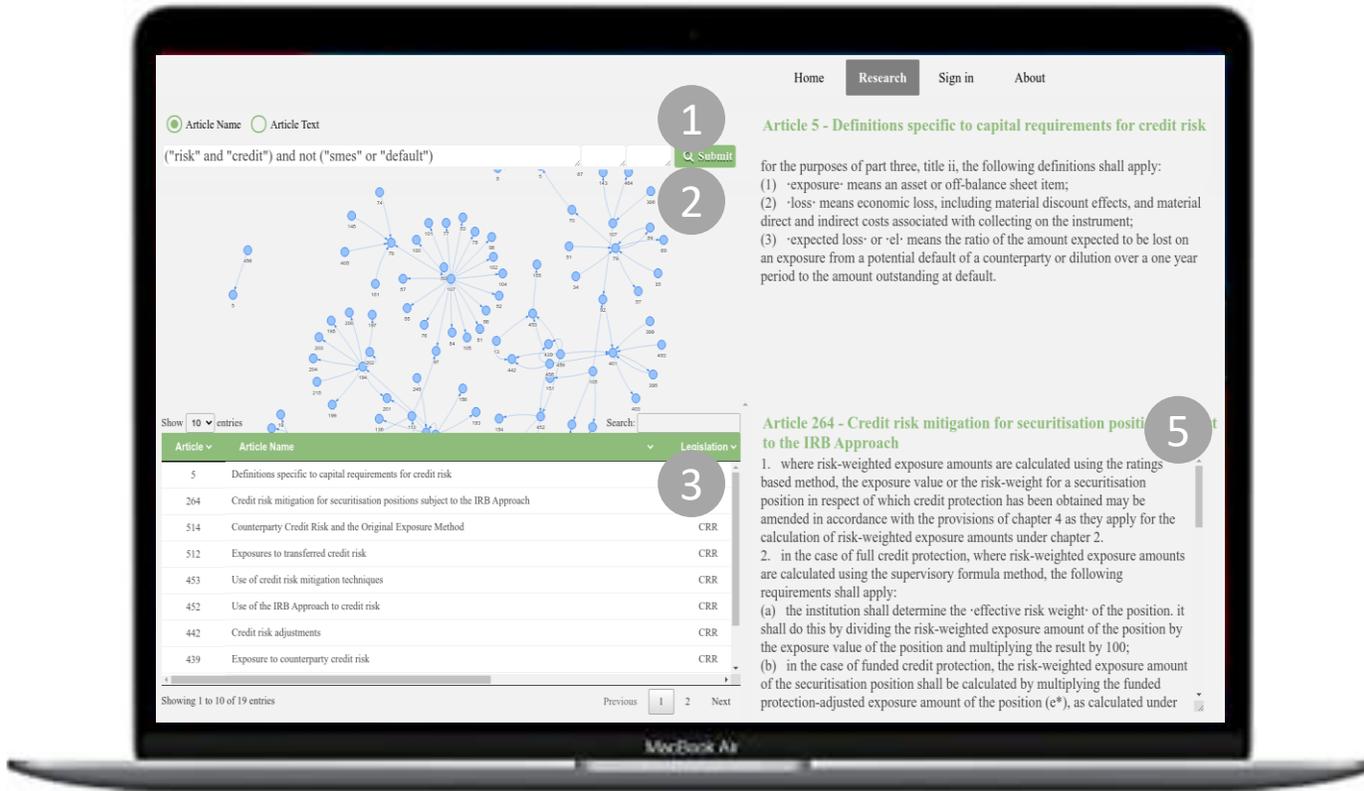
Question Answering

Find direct answers to natural questions considering context and meaning

- Get contextual answers to naturally formulated questions
- Considers the intent and contextual meaning of search phrases resp. understanding the overall meaning of the query
- Distinguished from lexical search where the search engine looks for literal matches of the query words or variants of them
- Seeks to improve search accuracy by understanding the searcher's intent and the contextual meaning of terms as they appear in the searchable dataspace

Discover

Identify relevant articles using Boolean search and knowledge graphs



1

Keyword search using Boolean operators (AND, OR, NOT) to widen or specify search scope

1

Article 5 - Definitions specific to capital requirements for credit risk

for the purposes of part three, title ii, the following definitions shall apply:
(1) 'exposure' means an asset or off-balance sheet item;
(2) 'loss' means economic loss, including material discount effects, and material direct and indirect costs associated with collecting on the instrument;
(3) 'expected loss' or 'el' means the ratio of the amount expected to be lost on an exposure from a potential default of a counterparty or dilution over a one year period to the amount outstanding at default.

2

Visualization of search term relevant articles as well as their relationship to each other to identify context articles

3

Result list showing for the current search prioritizing articles that are mentioned most by other articles of this search context to identify the most relevant articles for your search

3

Article 264 - Credit risk mitigation for securitisation positions subject to the IRB Approach

1. where risk-weighted exposure amounts are calculated using the ratings based method, the exposure value or the risk-weight for a securitisation position in respect of which credit protection has been obtained may be amended in accordance with the provisions of chapter 4 as they apply for the calculation of risk-weighted exposure amounts under chapter 2.
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5

4

Display of the **most relevant article**. The displayed article can be kept fixed as well as exchanged by other articles

5

Display of the **second most relevant article**. The displayed article can be kept fixed as well as exchanged by other articles

Question & Answer

Get direct answers to natural questions

The screenshot shows a web application interface with the following components:

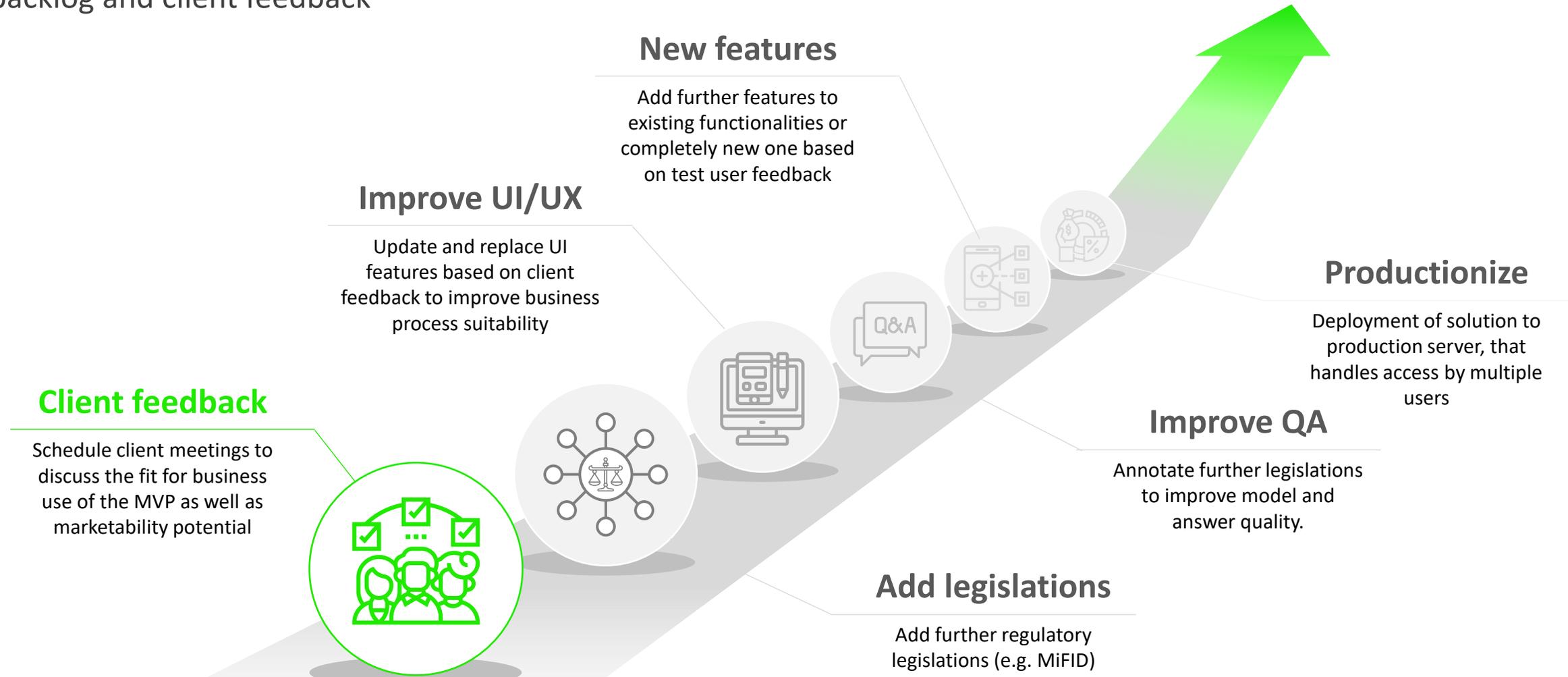
- Navigation:** Home, Research, Sign in, About
- Legislation:** All (selected), CRR, CRD, MIFID
- Question:** What are institutions? (1)
- Answer:** credit institution or an investment firm (2)
- Article 4 - Definitions:** 1. for the purposes of this regulation, the following definitions shall apply:
(1) 'credit institution' means an undertaking the business of which is to take deposits and other repayable funds from the public and to grant credits for its own account;
(2) 'investment firm' means a person as defined in point (1) of article 4(1) of directive 2004/39/eg, which is subject to the requirements imposed by that directive, excluding the following:
(a) credit institutions;
(b) local firms;
(c) firms which are not authorised to provide the ancillary service referred to in point (1) of section b of annex i to directive 2004/39/eg, which provide only one or more of the investment services and activities listed in points 1, 2, 4 and 5 of section a of annex i to that directive, and which are not permitted to hold money or securities belonging to their clients and which for that reason may not at any time place themselves in debt with those clients;
(3) 'institution' means a credit institution or an investment firm;
(4) 'local firm' means a firm dealing for its own account on markets in financial futures or options or other derivatives and on cash markets for the sole purpose of hedging positions on... (3)
- Network Visualization:** A central node (4) connected to 15 other nodes with varying weights (e.g., 25, 197, 104, 494, 142, 456, 162, 23, 3, 2, 301, 508, 113, 4, 31, 71, 4). (4, 5)
- Table:** A table showing 5 most relevant answers with columns: #, Answer, Article, Legislation, Probability.

#	Answer	Article	Legislation	Probability
1	credit institution or an investment firm	4	CRR	0.790480
2	investment firms	1	CRD	0.787443
3	undertakings	91	CRD	0.763302
4	management body	3	CRD	0.748819
5	central governments and central banks	201	CRR	0.710783

- 1 Input of both the **natural language question** and specification of the relevant **legislation**
- 2 Display of the **most relevant answer** for the question
- 3 Display of the **most relevant article**. The displayed article can be fixed as well as exchanged by other articles
- 4 **Visualization** of relevant article as well as their relationship (inbound vs. outbound) to each other to identify context articles
- 5 Display of the **5 most relevant answers** incl. relevant meta information

The road ahead

We will productionize the MVP in the upcoming month for a wider audience based on both our own backlog and client feedback



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