



## IP5 NET/AI ROADMAP

In 2019, the IP5 Offices decided to further advance their co-operation in the area of new emerging technologies (NET) and artificial intelligence (AI) by instituting a taskforce, resulting in the development of a comprehensive roadmap for possible projects and initiatives in areas which benefit most from joint IP5 responses.

The IP5 NET/AI Roadmap is intended to serve as a blueprint for IP5 Offices' joint endeavours to harness NET/AI capabilities in support of their patent grant processes and provide transparency in their patent practices and predictability of patent prosecution for their users.

The IP5 NET/AI Roadmap identifies **four key areas of co-operation**:

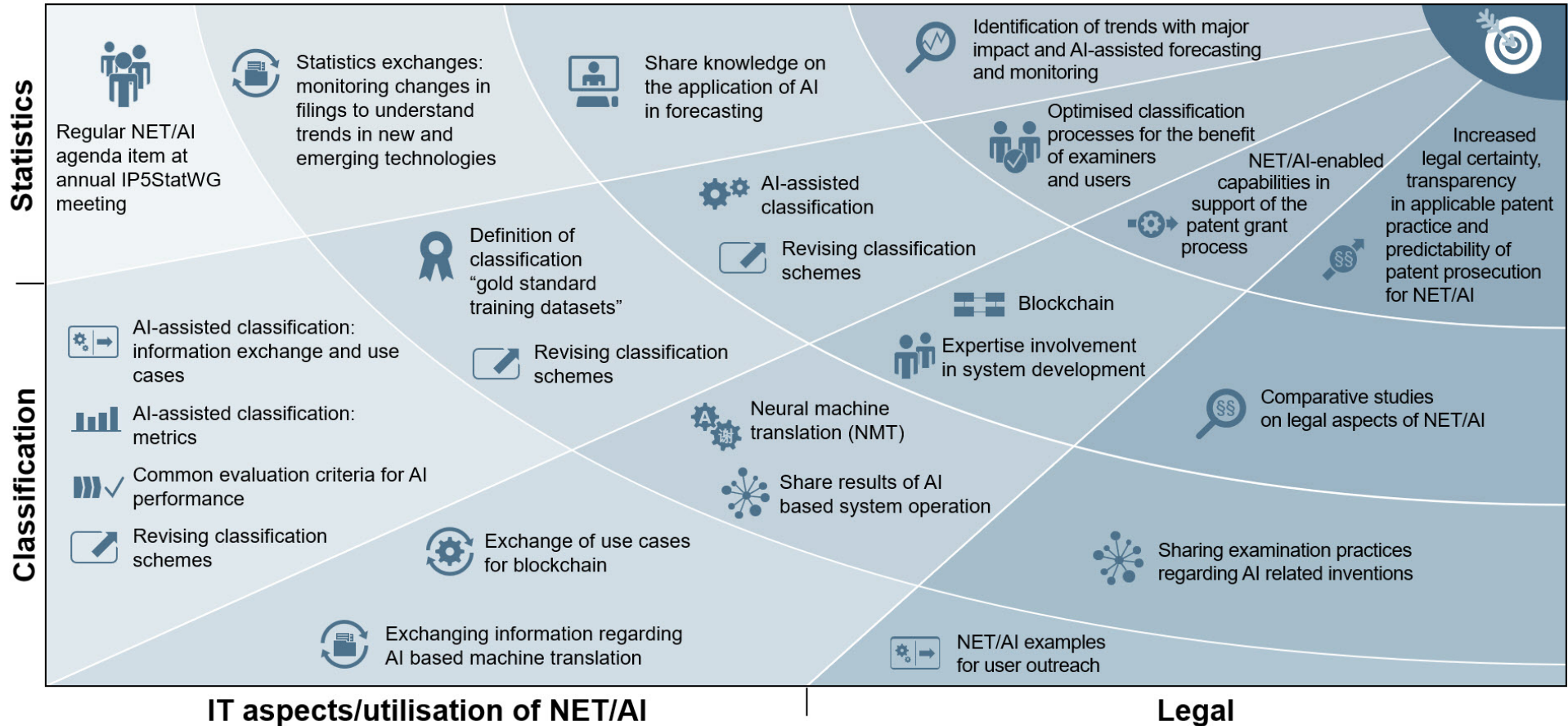
- **Statistics**
- **Classification**
- **IT aspects/utilisation of NET/AI**
- **Legal**

### Implementation Principles

For each of these areas, the Roadmap formulates short-, medium- and long-term co-operation opportunities broad enough to accommodate future developments, which will allow the design of possible projects. The exact scope, timelines and resource requirements for these potential areas of work will be developed by the various IP5 working groups in line with established IP5 project management processes, including necessary review cycles.

Certain projects may be pursued by a limited number of offices or in differing time frames, i.e. it is not necessary to proceed in lockstep. Consequently, experts at working group level will define the respective implementation model including possible pilot projects between two or more offices for proof-of-concept purposes. Offices involved in pilot projects will report the project details and status to the respective working group experts and other offices will be able to join at any stage. Considering the interdisciplinary nature of NET/AI endeavours, co-operation across IP5 working groups will be explored.

# IP5 NET/AI OPPORTUNITIES



## Statistics

### Objective

- A thorough understanding of key trends enables coordinated and balanced policy responses at the IP5 Offices that takes all IP5 Offices views into consideration. Work should be the result of continuous information exchange and experience sharing that helps promote the IP5 Offices' understanding of key technology trends and market developments which may potentially shape longer-term perspectives on how the offices operate.
- Regular statistics exchanges between the IP5 Offices would be beneficial for identifying and monitoring emerging trends that are expected to have a major impact.

### Goals

Within the area of statistics, the IP5 statistics experts will:

- Consider possible statistics exchanges on technologies, including monitoring of trends in NET/AI, and identifying and determining the feasibility of new methodologies and refinements of existing metrics to accommodate this effort
- Share information on the use of various advanced analytics technologies and methodologies being employed for other IP5 Offices to learn and consider as ways to help improve and enhance the forecasting of patent filings

### Milestones

The following potential areas of work could be considered by the working groups in the area of statistics:

- Start regular exchanges on NET/AI as a standard topic on the meeting agenda of the IP5 Statistics Working Group
- Share information and experiences on statistics on AI, and agree on methodology, definition and scope to identify NET/AI related filings
- Start statistics exchanges to monitor changes in filings and understand trends in new and emerging technologies
- Share information on the use of AI and other advanced analytics in forecasting patent filings and exchanging experiences in this area to further enhance forecasting activities
- Develop AI-assisted monitoring and forecasting in order to identify trends with major impact on IP5 Offices' activities

Experts from the working groups will determine topics from this list where the IP5 Offices are able to collaborate bilaterally or multilaterally to have information exchanges and/or develop proofs of concept for projects. The IP5 Offices will identify relevant stakeholders, and/or experts that are needed for collaboration and establish clear objectives, scope, resource requirements, and timelines.

### Dependencies

- Interdependencies exist with other areas of the roadmap such as IT aspects and close co-operation with IT experts will be sought as needed.
- Specific statistics exchanges, trend analysis and related activities within the IP5 Statistics Working Group can support work by other working groups.

- Existing work and priorities within the IP5 Statistics Working Group will need to be considered and an evaluation of existing statistics reports and information exchanges will be required.

## **Classification**

### **Objective**

- Aligned classification schemes and practices among the IP5 Offices enhance the efficiency of the search process for applications related to NET/AI, in particular for cross searching the IP5 prior art collections.
- Assigning classification symbols to patent documents by technology field is a common task among the IP5 Offices and could be done more efficiently with the support of AI technologies, depending on the classification processes within each IP5 Office. Identifying ways to optimize classification processes at the IP5 Offices would bring benefits for examiners and users.
- In AI-assisted classification, a better understanding of use cases provides insights into possible ways to improve business processes and a potential joint IP5 approach leads to consistency on a technical level and, thus, promotes applicants' trust in AI based approaches.
- Common metrics, evaluation criteria, and an understanding of the differing classification processes at each IP5 Office would be critical to understanding and evaluating the benefits of AI-assisted classification systems, and will help the IP5 Offices to establish appropriate benchmarks to gain a better picture of the 'success' rate of different strategies and approaches at the IP5 Offices.
- In the longer term, by leveraging the understanding on the different business processes occurring at the IP5 Offices, identification of additional use cases for AI can be made to create additional efficiencies and improvements to Office business processes.

### **Goals**

Within the area of classification, the IP5 classification experts will:

- Lead efforts amongst IP5 Offices to exchange information on current classification practices to the extent possible, including use cases of or business needs for AI-assisted classification in work processes, and how AI-assisted classification is expected to help the Offices improve existing classification practices
- Coordinate the sharing of ideas on possible evaluation criteria for AI performance on classification, which could potentially include defining a common set of metrics for providing a single lens amongst the IP5 for evaluation of AI classification tools being developed and, if possible, identify and determine feasibility of mechanisms for developing training datasets for the purpose of training machine learning algorithms in patent classification
- Identify ways to further improve the classification scheme to accommodate new emerging technologies, which may include solutions besides the creation of new classification allocations or technology fields

## **Milestones**

The following potential areas of work could be considered by the working groups in the area of classification:

- Share information on current classification practices, use cases of or business needs for AI-assisted classification in work processes, experience and practices of classification experts involved in AI-assisted classification. Establish metrics and evaluation criteria to examine the performance of AI-assisted classification systems
- Share principles for selecting standardized training datasets for the purpose of training machine learning algorithms in patent classification
- Share knowledge on technologies for and experiences with AI-assisted classification and exchange information on trained AI models for classification as valuable resources worthy of use for reference
- Use AI-assisted trend analysis to assist in identifying technical areas where classification schemes need to be revised and to assist in proposing new classification entries
- Promote the continuous sharing of information on the classification revision practices in the field of NET/AI among the IP5 Offices

Experts from the working groups will determine topics from this list where the IP5 Offices are able to collaborate bilaterally or multilaterally to have information exchanges and/or develop proofs of concept for projects. The IP5 Offices will identify relevant stakeholders, and/or experts that are needed for collaboration and establish clear objectives, scope, resource requirements, and timelines.

## **Dependencies**

- Interdependencies exist with the IT and statistics aspects in this roadmap and implementation of projects in the various phases will be determined in consultation between classification, IT and statistics experts. The practical handling of dependencies will be addressed at working group level.
- Scope and feasibility of work assessment (that takes into account resource, legal, and security considerations) will need to be performed by the relevant working groups and IP5 Offices.
- Classification experts will determine the technical areas where classification schemes need to be revised and the necessity of new classification entries on a case-by-case basis, taking into account the balance between the cost of reclassification and the benefits such as improvement of search efficiency.

## **IT aspects/utilisation of NET/AI**

### **Objective**

- All IP5 Offices aim to identify opportunities where NET/AI-enabled capabilities may improve the patent grant process. They will share their individual approaches and experiences, jointly explore the potential of new technologies for further optimising their operations and,

wherever possible, determine areas or ways where the development of common AI tools and harmonised strategies could be beneficial.

- Neural machine translation technology and blockchain, a decentralized, distributed ledger that records transactions, have been proposed as having big potential for the IP system, although concrete use cases and clear benefits remain to be established. Therefore, the IP5 Offices are expected to analyze and determine the value and benefits of these technologies. Joint IP5 and WIPO approaches, if possible, in these areas will ideally lead to consistency on a technical level and promote applicants' trust in NET/AI-based approaches.

## Goals

Within the area of IT and utilisation of NET/AI, the IP5 IT experts will:

- Exchange information on practice, use case and experience in IT fields to promote NET/AI implementation in automatic search, AI-assisted classification, AI-based machine translation (MT) and other possible business scenarios, as well as blockchain approaches
- Co-operate to optimize existing NET/AI systems, such as AI-search and AI-assisted classification
- Evaluate the need for criteria to measure AI performance, including a common set of metrics.
- In other areas where benefits to collaboration opportunities could be identified (for example, amongst IP5 Offices that are pursuing AI machine translation), actively collaborating IP5 Offices will engage in regular exchanges on their processes and efforts (such as on AI-based machine translation technologies) and explore possible co-operation approaches
- As part of a long-term effort and goal, and in co-operation with WIPO, the IP5 Offices may consider collaboration on other prototypes leveraging new emerging technologies, on an agreed use case of mutual interest
- Due to the different use cases and development stages of NET/AI-based systems at individual IP5 Offices, a “no-lockstep” approach is favoured for project implementation. Pilot projects between two or more offices can be deployed for proof-of-concept purposes

## Milestones

The following potential areas of work could be considered by the working groups in the area of IT aspects/utilization of NET/AI:

- Share approaches, practices and experiences in NET/AI implementation, including how new technologies are utilized in automatic search, AI-assisted classification, AI-based MT and other possible business scenarios, as well as blockchain approaches
- Share experiences with use of AI-based MT, such as neural machine translation (NMT), or technical knowledge of such machine translation tools in use or under development and choose the potential co-operation mechanism among IP5 on MT
- Start regular exchanges among all IP5 Offices to identify potential use cases of blockchain technology in patent operations
- Share experiences with and plans for the use of blockchain technology, and work together to identify any possible areas or methods of further collaboration
- Collaborate in a decentralized private blockchain prototype as a proof of concept
- Analyse the results of the bilateral CNIPA-KIPO comparative study on the performance of AI-based systems in search and classification and consider an IP5-wide approach towards measuring the quality level of AI systems

- Gain a better understanding of best practices in the management of NET/AI-related IT projects at the IP5 Offices, and on the mechanism of co-operation between internal and external IT and NET/AI experts

Experts from the working groups will determine topics from this list where the IP5 Offices are able to collaborate bilaterally or multilaterally to have information exchanges and/or develop proofs of concept for projects. The IP5 Offices will identify relevant stakeholders, and/or experts that are needed for collaboration and establish clear objectives, scope, resource requirements, and timelines.

### **Dependencies**

- Interdependencies exist with other areas in this roadmap (classification, statistics) and implementation of projects in the various phases will be determined in consultation between the relevant experts.
- Scope and feasibility of work assessment (that takes into account resource, legal, and security considerations) will need to be performed by the relevant working groups and IP5 Offices.

## **Legal**

### **Objective**

- Increased transparency and awareness regarding the practices of the IP5 Offices applicable to the patenting of NET/AI will promote predictability of prosecution outcomes and strengthen legal certainty.

### **Goals**

Within the area of legal, the IP5 legal experts will:

- Employ a phased approach in pursuit of the outlined objective to be determined in detail at working level
- Endeavour to provide an overview of their respective practices applicable to the patenting of NET/AI related inventions as a first stage
- Clarify and highlight specific aspects of these practices
- Employ tools, such as comparative studies, to facilitate the in-depth analysis of practice cases

### **Milestones**

The following potential areas of work could be considered by the working groups in the area of legal:

- Share practice examples already available at the IP5 Offices in a consolidated and user-friendly manner
- Provide information on specific examination practices, to the extent available, regarding the patenting of NET/AI related inventions
- Consider comparative studies on legal aspects of NET/AI

- Promote legal certainty and transparency through continuous information-sharing on legal aspects of NET/AI

Experts from the working groups will determine topics from this list where the IP5 Offices are able to collaborate bilaterally or multilaterally to have information exchanges and/or develop proofs of concept for projects. The IP5 Offices will identify relevant stakeholders, and/or experts that are needed for collaboration and establish clear objectives, scope, resource requirements, and timelines.

### **Dependencies**

- A high degree of interdependency is inherent in the milestones and goals outlined above.
- The existing IP5 communication channels will be utilised to facilitate exchanges at expert level throughout the various co-operation phases.
- Details of the appropriate involvement of legal experts in activities related to other sections of this roadmap will be determined at the working level on a needs basis.

### **Next steps**

This IP5 NET/AI Roadmap is the start of a streamlined IP5 approach in response to the challenges and opportunities arising from new emerging technologies and artificial intelligence.

Using the Roadmap as a guide, the experts from the various IP5 working groups will explore how they can build on their existing expertise and strengths to plan and implement joint projects for the benefit of the offices and users.

As the IP5 Offices develop their joint endeavours, they will engage with stakeholders from industry to ensure that future IP5 co-operation on NET/AI meets the needs of users.