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Automation and AI-based tools

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SUMMARY



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TOOL PORTFOLIO DEVELOPMENT



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AUTOMATION AND AI-BASED TOOLS FOR :

- Patent Pre-classification
- Patent Classification
- Patent examination
- Figurative Trademarks Classification
- Information extraction from historical trademark gazettes
- Document anonymization



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CONCLUSION - An expanding project portfolio



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TOOL PORTFOLIO DEVELOPMENT

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TOOL PORTFOLIO DEVELOPMENT

In 2019, creation of The Lab, a department dedicated to new frontier technologies, particularly AI, in order to identify needs, develop and optimize internal tools that help the office services.

- ▶ **Improve the efficiency** of internal processes and enable new opportunities.
- ▶ **Creation of prediction models** from experiences and databases to automate repeatable and low added value tasks.

Development of automation tools (macro) to assist patent examiner in their task.

- ▶ **Internal development** by examiners.
- ▶ **Regular optimization** of tools and training.

TOOL PORTFOLIO DEVELOPMENT

How INPI's Lab works, our guiding principles

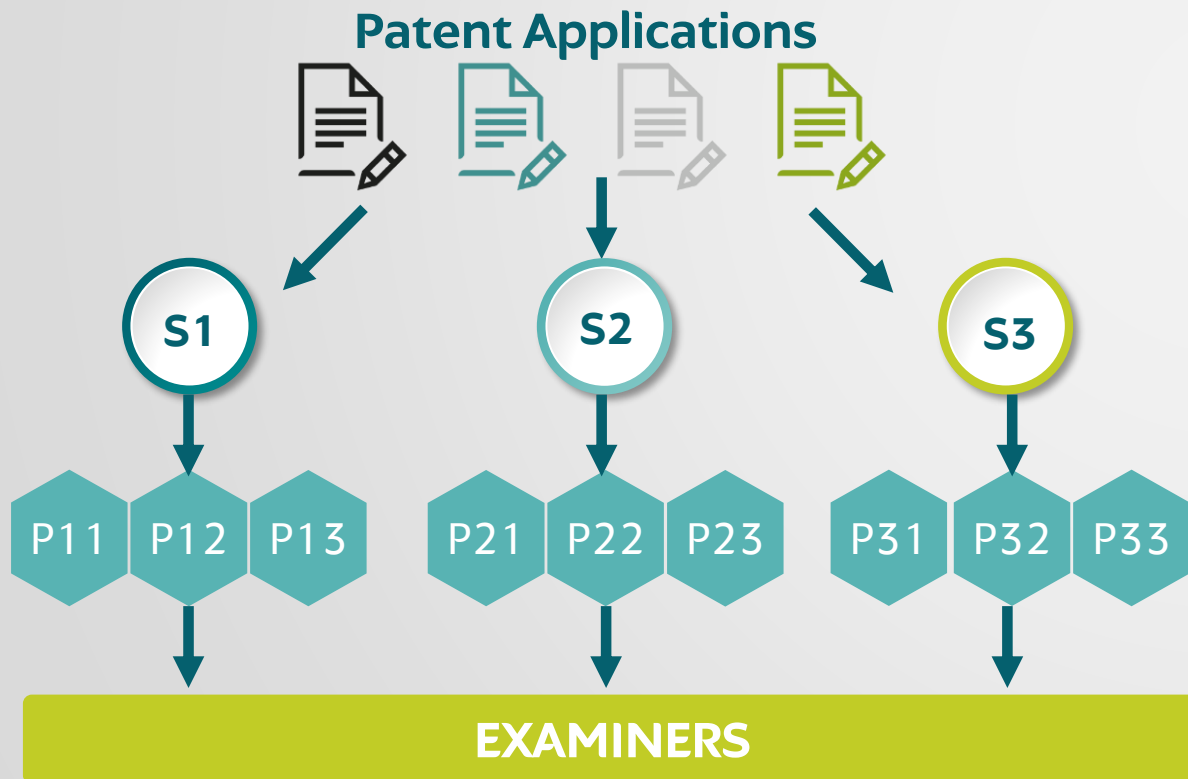
- ▶ **Emerging technology focus:** improve the efficiency of our internal processes and enable new opportunities.
- ▶ **Business needs first:** no proof of concept for proof of concept's sake.
- ▶ **Quick wins:** focus first on projects with high potential and relatively low complexity.
- ▶ **Overall consistency:** Regular review and consolidation of the project portfolio.
- ▶ **Agile development:** Delivery of incremental versions of the solution.
- ▶ **Pragmatic implementation:** Develop, buy or partner depending on time constraints, internal resource availability, market offers and maturity of related AI technology.

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AUTOMATION AND AI-BASED TOOLS

PATENT PRE-CLASSIFICATION & DISTRIBUTION

- ▶ **Situation before 2019** : A process in 2 steps with a pre-distribution of patent applications to team leaders then a distribution to examiners.
- ▶ Need to have **a tool which facilitates the assignment of patent applications** to the examiner teams **by the automation of patent distribution**.



- ▶ 300 applications per week
- ▶ Distribution among 3 services and then to examination teams
- ▶ Significant analysis work by service managers and team leads
- ▶ Error prone even when done by humans

PATENT PRE-CLASSIFICATION & DISTRIBUTION

- ▶ **April 2019** : deployment of a first simple model trained with an internal database (with 1 50 000 published patents).
 - ▶ Tool based on text **processing and machine learning**.
 - ▶ **Success rate around 80%**.
- ▶ **December 2021** : improvement of the tool with the deployment of a new deep learning model trained with the addition of recent data.
 - ▶ **Success rate of 92%**.
 - ▶ **Significant time saving estimated at 20 to 30 hours per week in total**.
 - ▶ **Enable patent distribution to examiners and give level 4 IPC classification (ex: A61K8)**.

PATENT CLASSIFICATION & DISTRIBUTION

- ▶ **Collaboration** with a research institute on this cutting-edge technology.
- ▶ **Data collection and augmentation** to have the right quality and quantity of patent data.
- ▶ **Precision** ~ 70% for the first predicted main group.
- ▶ **Supporting patent engineers** in IPC classification task since 2023, hence saving time.
- ▶ **Serving as training tool** for juniors.
- ▶ **Harmonizing patent classification** among examination teams.
- ▶ **Enabling up-to-date statistics** on technology trends.

PATENT EXAMINATION TOOLS

Automation tools (macro) are developed internally in the Patent Department by a dedicated group of examiners.

Tools already used by examiners in their practices are :

- ▶ Docx compliance check
- ▶ Claim support search
- ▶ Reference sign detection
- ▶ Application version comparison
- ▶ EMF to PNG conversion
- ▶ IPC import from cited reference

FIGURATIVE TRADEMARKS CLASSIFICATION

- ▶ **Before 2021**, an unsatisfactory situation :
 - ▶ 36 000 figurative trademarks (with logos) registered per years.
 - ▶ Outsourced task with several drawbacks, specifically publication delays and cost.
- ▶ **Since May 2021** :
 - ▶ **Acquisition of a commercial tool**, using advanced AI technology, to assist examiners in this task.
 - ▶ **Trademark classification internally** using AI technology, to assist examiners in this task.
 - ▶ Define mechanisms to guarantee performance with a tailored accuracy metric
 - ▶ Simplification of publication flow.
 - ▶ In production since July 2021 enabling 50% cost saving and with no need for extensive trainings, saving of more 70 k€/year.

INFORMATION EXTRACTION

Index historical trademark gazettes

- ▶ **1884 to 1920 official gazettes** available in paper and scanned formats
- ▶ **With the objective to enrich** our historical open data portal
- ▶ **Automated data extraction and indexation** are needed to enable multi-criteria searches
- ▶ **Ongoing work** training a set of models to extract figures and structured data



First model:
Segmentation
and labelling



DOCUMENT ANONYMIZATION

- ▶ **Anonymization of INPI decisions** before their publication.
 - ▶ Tool developed internally to identify and mask personal data.
 - ▶ In production since 2021 then 2022 for machine learning.
 - ▶ Examiner can generate anonymous pdf documents.
 - ▶ Enable to obtain an anonymized document in few tens of seconds against tens of minutes before the deployment of the tool.



**CONCLUSION
AN EXPANDING
PROJECT PORTFOLIO**

CONCLUSION

An expanding project portfolio

Ongoing projects at various development stage :

With already 7 deployed AI-based tools :

- ▶ Patent pre-classification and IPC classification.
- ▶ Vienna classification of trademarks.
- ▶ Automation for recordals.
- ▶ Document anonymization (detection and suppression of IDs).
- ▶ Document anonymization (Removal of personal data form publishable decisions).

... projects at various stages of development :

- ▶ Information extraction from historical trademark gazettes.
- ▶ A callbot following the extension of our chatbot.
- ▶ Ongoing development and optimization of macros to help examiners in their practices.

... and new projects under definition (next strategic plan).



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THANK YOU !
Merci



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