



# SUPERVISORY TECHNOLOGY STRATEGY

## SUPERVISORY TECHNOLOGY (SUPTECH)

Supervisory technology (SupTech) is the use of technology by supervisors to deliver innovative and efficient supervisory solutions that will support a more effective, flexible and responsive supervisory system.

This note aims to define such a strategy and covers both prudential and conduct of business supervision, policy and interaction with entities, for insurance and occupational pensions sectors.

<https://www.eiopa.europa.eu>

## 1. BACKGROUND

During the 2019 EIOPA Strategy Day one of the topics for discussion was the use of new technologies in supervision. NCAs and EIOPA agreed that, as a next step, enhanced cooperation and common work would be beneficial. To do so, EIOPA and its members should develop a common SupTech strategy, starting by defining the objective and the areas of common interest where joint development would be more adequate.

Being a relatively new terminology, for the purpose of this document, it is important that SupTech is defined. The definition proposed considers existing literature on the topic as well the context of this Strategy.

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For EIOPA it is a strategic priority to improve efficiency and effectiveness of the Supervisory Review Process by the continuous improvement of its business intelligence capability, focusing on enhancing the analytical framework, risk reports and the publication of statistics while taking advantage of new technological developments and the opportunities they present.

From a supervisory convergence perspective, the Annual Supervisory Convergence Plan<sup>1</sup> sets the priority areas for the convergence of supervisory practices where EIOPA – in cooperation with NCAs – will develop work, supporting increased consistency of supervisory practices across the EU. As an outcome, tools such as EIOPA Guidelines, the Supervisory Handbook, Supervisory Statements or other EIOPA tools will be developed to further support NCAs to reach a high quality and effective supervision while ensuring convergence of supervisory practices.

The goal of this common SupTech Strategy is to provide the grounds for the establishment of a mid and long term coordinated plan for SupTech development which will deliver supervisory tools or processes, considering

EIOPA's strategic objectives<sup>2</sup> and the Annual Supervisory Convergence Plan.

For this purpose, it is worth remembering the following key aspects identified by Members during the Strategy Day:

- Follow a design thinking<sup>3</sup>, focusing on creating products, services, experiences or systems that work for those who use them;
- Include the human dimension, identifying the needs of supervisors and how the new solutions are going to be used by them;
- Step-by-step approach allowing proper testing of all ideas at an early stage;
- Promote experience and ideas sharing, both successful and non-successful real cases;
- Structure the future work in an flexible environment.

Several areas could benefit from the use of new technologies or the development of innovative solutions, however resources are limited and therefore prioritisation will be key for the success of the initiative. From all the possible projects, EIOPA and its Members highlighted some focus areas (identified in the conclusions of the Strategy Day):

- improving data sharing and data analytics, in particular the development of a common risk assessment framework;
- supporting market monitoring from a conduct of business perspective, in particular by developing a tool to automate the assessment of the information available in the Key Information Document<sup>4</sup> (KID) established by the Packaged Retail Investment and Insurance Products (PRIIPs) Regulations<sup>5</sup> or in the Insurance Product Information Document<sup>6</sup> (IPID) established by the Insurance Distribution Directive (IDD)<sup>7</sup>;

<sup>2</sup> EIOPA's strategic objectives: <https://www.eiopa.europa.eu/about/mission-and-tasks>

<sup>3</sup> Design Thinking is an iterative strategic process to develop design concepts. The objective is to understand the user, challenge assumptions, and redefine problems so alternative creative strategies and solutions can be identified.

<sup>4</sup> The Key Information Document (KID) for Packaged Retail and Insurance-based Investment Products (PRIIPs) is a mandatory, three-page A4 information document to be provided to consumers before purchasing a PRIIP

<sup>5</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:%3A32014R1286>

<sup>6</sup> Under the Insurance Distribution Directive (IDD), consumers will benefit from a simple, standardised insurance product information document (IPID), which aims to provide clearer information on non-life insurance products, so that consumers can make more informed decisions.

<sup>7</sup> <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:%3A32016L0097>

<sup>1</sup> <https://www.eiopa.europa.eu/supervisory-convergence-plans-and-reports>

- Assessing to what extent the already existing Solvency II data in combination with available and comparable data on consumer complaints data can be further exploited for conduct of business supervisory purposes with the use of new technologies, including the development of a Retail Risk Indicators Dashboard. In this regard it should also be considered following a data-pull approach to gather additional information on retail products relevant for conduct of business purposes.

In addition to the EIOPA Strategy Day, available SupTech publications have been considered as input<sup>8</sup>.

## 2. INTRODUCTION

During the last years, new technologies like internet of things (IoT), blockchain (DLT), artificial intelligence (AI) and machine learning (ML) have started to be applied in several fields, including financial services where the expression “InsurTech” refers specifically to technology in the insurance business.

EIOPA has created the InsurTech Task Force (ITF) to deal with the use of these new technologies and their supervision. The work has started with the topic Big Data Analytics<sup>9</sup>, innovation facilitators<sup>10</sup>, and regulatory barriers to InsurTech. In 2019 the ITF has developed guidelines on cloud computing<sup>11</sup> and has also worked in the area of supervision of AI and ML algorithms as well as on the new business models arising from InsurTech<sup>12</sup>.

In 2020 the ITF is also expected to work on the RegTech field, i.e. the application of new technologies for regulatory and compliance requirements by the undertakings. Some potential uses of RegTech are for example on

compliance, risk management and regulatory reporting, among others.

Around the world, supervisory authorities are assessing how to increasingly use such technologies to support their supervisory review process, making it more flexible and responsive. This would potentially translate in improvements of effectivity and efficiency of supervision in general. Some of the main uses of SupTech identified are for example on automating and streamlining administrative and operational procedures (including interaction with the undertakings), digitising data, digitising working tools, improving data analytics and enhancing data visualisation, among others<sup>13</sup>.

Some NCAs have already defined their own SupTech Strategy, either formally or informally. With this document EIOPA intends to adopt a formal SupTech Strategy. This Strategy aims to identify the objectives and areas of common interest where enhanced cooperation and common work would be beneficial to EIOPA and NCAs following a common supervisory culture, thus contributing to supervisory convergence.

## 3. CURRENT SITUATION

This section identifies the current status of both EIOPA and NCAs, and assesses today's data availability and data quality.

### EIOPA

The use of technology by EIOPA has been increasing over the years. EIOPA is making good use of IT technologies in areas such as data collection with the use of a centrally managed XBRL taxonomy for both insurance and pensions, data analysis for internal use and the development of reports for NCAs using the European database. Currently EIOPA is also developing a tool to support supervisors in the assessment of the adequacy of Technical Provisions for the Motor Liability Line of Business, using claims triangles (SII QRT<sup>14</sup>) and other information available. Finally, EIOPA has initiated the project “Business

8 FSI Insights on policy implementation No 9 “Innovative technology in financial supervision (SupTech)” – July 2018 and No 19 “The suptech generation” – October 2019

ESMA – Developments in RegTech and SupTech – November 2018  
Toronto Centre – FinTech, RegTech and SupTech: what they mean for financial supervision

Toronto Centre – SupTech: Leveraging Technology for Better Supervisions – July 2018

9 [https://www.eiopa.europa.eu/content/eiopa-reviews-use-big-data-analytics-motor-and-health-insurance\\_en](https://www.eiopa.europa.eu/content/eiopa-reviews-use-big-data-analytics-motor-and-health-insurance_en)

10 [https://www.eiopa.europa.eu/content/esas-publish-joint-report-regulatory-sandboxes-and-innovation-hubs\\_en](https://www.eiopa.europa.eu/content/esas-publish-joint-report-regulatory-sandboxes-and-innovation-hubs_en)

11 [https://www.eiopa.europa.eu/content/eiopa-consults-guidelines-outsourcing-cloud-service-providers\\_en](https://www.eiopa.europa.eu/content/eiopa-consults-guidelines-outsourcing-cloud-service-providers_en)

12 <https://www.eiopa.europa.eu/content/eiopa-establishes-consultative-expert-group-digital-ethics-insurance>

13 Definitions developed using Toronto Center publications on the issue.

14 Quantitative Reporting Templates

Intelligence 2.0”<sup>15</sup> which will assess efficiencies and new data tools for different uses within EIOPA.

At this stage the appetite and expectations for the use of data and the role of EIOPA on supervisory convergence are increasing. This was evidenced and confirmed in EIOPA's Data Strategy 2019-2023 approved in the BoS meeting in March 2019. The purpose of this strategy has been to identify all business needs arising from EIOPA's different functions, roles and responsibilities and identify ways to unlock business value to make the utmost use of data in achieving EIOPA's objectives.

The approval of the Data Strategy was followed by EIOPA's IT Strategy 2019-2023 approved by the BoS in June 2019. It considered the adopted Data Strategy with its vision on EIOPA's role as regulator, user, facilitator and publisher and its call for assurance, automation and resilience. It also considered EIOPA's ambition to improve its internal processes with the help of modern information technology.

EIOPA has already experimented in the past with some of these new technologies and their application to supervision, like the social media monitoring tool which used Natural Language Processing (NLP) technologies to assess the sentiment of comments about insurance in social media.

## NATIONAL COMPETENT AUTHORITIES

As previously mentioned, some NCAs have already defined their own SupTech Strategies, either formally or informally. Based on this, different SupTech use cases have been identified. The examples may be classified in the following three areas:

- a) Organisational changes to prepare the authorities to SupTech, including culture and training programs;
- b) Enhancing a number of internal administrative supervisory processes and facilitating digital interaction with financial institutions;
- c) Improving supervisory processes and the use of data, both quantitative and qualitative, to be able to identify and understand risks at an early stage and improve supervisory processes in general.

<sup>15</sup> Business Intelligence tool mentioned in the EIOPA Annual Work Programme [https://eiopa.europa.eu/Publications/WORK%20PROGRAMME/EIOPA-19-483\\_Single%20Programming%20Document%202020-2022.pdf](https://eiopa.europa.eu/Publications/WORK%20PROGRAMME/EIOPA-19-483_Single%20Programming%20Document%202020-2022.pdf)

Some NCAs have implemented organisational changes such as the creation of a Chief Digital Officer (CDO), a Chief Innovation Office (CIO) or specific teams to develop concrete projects and/or coordinate innovation between the organisational areas in the authority.

Some NCAs developed new channels of communication and exchange of information with undertakings to support administrative processes such as the registration and authorisation of new undertakings, fit and proper testing, approval of transferring technical provisions or pension liabilities. There are also examples on the development of robotic process automation (RPA) currently under development to support notifications, identify relevant data and save it in a database; in general, the concept of e-services seems to be evolving.

Intrapreneurship programmes have been promoted to identify and develop specific tools by NCAs. Supervisors were invited to present ideas to improve the efficiency and/or effectiveness of their work, and some projects have been chosen and are currently under development.

In the area of improving supervisory processes and the use of data, both quantitative and qualitative, several examples may be identified:

- a) Text analysis tool to compare the SFCRs<sup>16</sup> published with the Quantitative Reporting Templates, including sentiment analysis in both to assess differences;
- b) Structure prospects and yearly reports by using ML mechanism from unstructured documents;
- c) Text mining or analysis of narrative data with natural language processing to support the use of qualitative information like ORSA or SFCR, but also from data on authorisations and other publicly available sources;
- d) Smart search engine to access relevant information during on-site supervision activities;
- e) Monitor social media data to capture consumer sentiment and identify informal complaints, based on a 3rd party and APIs, then build programmes to do the analytics;
- f) Search tool among regulatory, methodology and doctrine texts relevant to the NCAs business, devel-

<sup>16</sup> Solvency and Financial Condition Report

oping a relevant content navigation and visualisation system that will rely on Text Mining algorithms;

- g) Exploit, through AI, the thousands of judicial decisions rendered each year against banking and insurance professionals to guide NCAs supervisory actions;
- h) The use of machine learning techniques to improve data quality and data analytics through supervised and unsupervised learning. Clustering, outlier detection, identification of patterns and trends are some examples;
- i) A new financial supervision tool based on predictive analytics that can make sense of a growing set of available data.

All NCAs have identified the compliance with IT and data governance and security rules as an important and challenging part of the projects.

Having a good interaction with users (supervisors) to make sure that the products developed are adequate and understandable and will be really used in practice was also identified as a challenge.

## DATA AVAILABILITY AND DATA QUALITY

The first requirement to develop SupTech tools is having access to the relevant data. From a prudential point of view, Solvency II quantitative reporting templates provide a wide range of solvency data, although other external sources should also be considered.

This common Solvency II reporting has allowed the creation of a common database at EIOPA level that includes more than 3,000 insurance and reinsurance undertakings. No other generation of supervisors than the current one has had so much information on the insurance market. Such a large database allows new types of analysis, like improving the creation of peer groups or the definition and detection of outliers and patterns. The current data availability is only 3 years but will grow. From the asset side the item-by-item reporting of both assets and derivatives provides sufficiently granular data, although from the liability side the information is significantly less granular. Under the 2020 Review<sup>17</sup>, EIOPA is proposing a revision of the information on insurance contracts in the

direction of more granular information for both life and non-life business.

To perform any analysis based on these data, a minimum level of quality needs to be guaranteed and, since the Solvency II reporting package is still relatively new, data quality is in the limelight. The growing number of validations included in the taxonomy represented a significant improvement that currently allows users to focus on data analytics. Besides, after a few years undertakings are more familiar with the reporting package and some errors tend to disappear through a better understanding of the QRTs and the dialogue between undertakings and NCAs.

However, the approach based on validations has some limitations. For example, each validation requires a deep analysis of all possible cases to ensure that it is always applicable, so templates where the analysis is less intensive usually exhibit more quality issues. However, even though core templates are less prone to include errors, some errors cannot be spotted with traditional validations for different reasons, e.g. data not granular enough to perform the validation or values that are possible only under extreme cases, preventing validations that would work in most of the cases. Also, validations can only check the consistency of the data; plausibility is far more difficult. Therefore, it might be useful to explore other (innovative) techniques to further improve data quality.

From a conduct of business supervision point of view, the situation is significantly different. Reporting requirements are not standardised at the European level, with many NCAs and EIOPA fully relying on Solvency II data and conduct relevant indicators based on Solvency II data. In many Member States, conduct supervision activities are predominantly reliant on the ex-post analysis of consumer complaints data which per se may not identify all conduct risks, as it relies on consumers identifying specific issues and complain about them.

Some of the revisions proposed under the 2020 Review can also be used to improve analysis from a conduct of business perspective. Therefore the focus could be two-fold:

- a) Further assessing how data available via Solvency II and other publicly available data be used;
- b) Data gathering.

For both cases it is crucial that a proper register of insurance and reinsurance undertakings, including cross-border authorisations, being through branches or freedom

<sup>17</sup> [https://www.eiopa.europa.eu/browse/solvency-ii/2020-solvency-ii-review\\_en](https://www.eiopa.europa.eu/browse/solvency-ii/2020-solvency-ii-review_en)

of services, is available and up-to-date. EIOPA has implemented an European Register and a revision of its implementation is due. Some inconsistencies between the national and European registers have been identified. An assessment of the structure and content of the European Register could be carried out, evaluating whether the technology used is still fit-for-purpose or whether other available technologies, such as for example blockchain, would be more appropriate for such type of registers.

#### 4. OBJECTIVES AND STRATEGY

EIOPA and its Members, as supervisors in a common European framework, share many goals such as the protection of consumers and enhancing financial stability in the markets; ensuring a high, effective and consistent level of regulation and supervision and enhancing the harmonisation and coherent application of the regulatory framework.

From the 3 areas identified above in which NCAs have been predominantly focusing their development of SupTech, i.e. (i) organisational changes to prepare the authorities to SupTech; (ii) enhancing a number of different processes and (iii) improving supervisory process and the use of data, the last one seems to be the one where the development of tools would be of common interest to EIOPA and its Members. In fact the other two areas seem to be more national specific as they address organisational issues and processes which are in many cases impacted by specific national law, namely administrative law. This conclusion has been confirmed by the results of the survey among the members of the SupTech Forum (see paragraph 40-41).

Given all the new possibilities that supervisors currently have in front of them, it is key to prioritise, thinking medium to long term and from a cost-benefit point of view. EIOPA and NCAs need to make wise choices to avoid the risk of being constantly changing the systems.

Changes always need to take into account the human dimension. Any change is always more welcomed if designed to solve concrete problems of day-to-day tasks. The development should follow a design thinking, focusing on new tools or processes that work for those who use them. Any new tools or processes are deemed to be used by supervisors to help them on their work, not to replace supervisors.

The human dimension needs to be considered also from the development perspective. NCAs and EIOPA need to build capacity from a data science and IT perspective to complement the technical and supervisory expertise of end-users. In some cases the use of external resources / service providers may be needed both to ensure the right competence, and capacity when resources are not available.

Based on the principle of adding concrete value for supervisors, a survey was run among the members of the SupTech Forum<sup>18</sup> to ask supervisors about their current needs and priorities for SupTech tools.

From a prudential supervision perspective the results of the survey showed a big appetite for tools to use in the area of supervision<sup>19</sup>. Areas such as cross-border business and authorisations were also identified, but far behind supervision. In the supervision area, tools for analysing specific aspects of the Solvency II framework such as investments, technical provisions, Solvency Capital Requirements were the ones most identified.

From a conduct of business perspective, the results of the survey<sup>20</sup> showed a big appetite for tools to use in the area of supervision as well, followed by authorisation and reporting. NCAs expressed a clear preference for tools to assess KID/IPID, build a dashboard for retail risk indicators or develop a tool to support the supervision of unit-linked life insurance contracts.

Based on the survey, **four main objectives** are identified:

- 1. Promote exchange of knowledge and experiences:** develop a way of working/structures to identify projects developed/under development in NCAs that can be useful for other NCAs or for EIOPA, and where the NCA is prepared to share knowledge or even code. For these projects, relevant information would be shared on a continuous basis such as contact persons in the NCA, the status of the project, other NCAs that are able to participate, questions if source code (e.g. R or Python) can be shared, etc. This

<sup>18</sup> 14 NCAs took part in the survey.

<sup>19</sup> The survey included approximately 30 tools and referred to 7 categories: Authorisation, Supervision, Financial Stability, Supervisory reporting, Publication of data, Others with the possibility to indicate further tools not included in the list.

<sup>20</sup> The survey included 10 tools and referred to 5 categories: Authorisation, Supervision, Supervisory reporting, Publication of data, Others with the possibility to indicate further tools not included in the list.

would also include the creation of a platform to share and improve source code/algorithms (e.g. via EIOPA Extranet or code sharing platforms like Github).

2. **Improving cooperation and exchange of information**, in particular a platform/hub to cooperate and exchange information and data sharing: where relevant, improve the existing cooperation processes, the means to exchange information and in particular the standardisation of some templates, content, means and timeliness of exchange of information in general and in particular data sharing.
3. **Improving data collection**: developing a standardised and efficient reporting framework for conduct of business, supporting market monitoring with the possibility of following non-traditional means to collect information on retail products.
4. **Improving data analytics** in prudential and conduct of business supervision, both for insurance and pension funds: the data available should be used to the utmost extent possible for the purposes of risk assessment, detailed analysis of specific topics, identification of early warning indicators, predictive analysis, etc.

**EIOPA SupTech Strategy** is promote the use of technology by supervisors to deliver innovative and efficient supervisory solutions that will support a more effective, flexible and responsive supervisory system by:

- a) implementing a platform for on-going **exchange of knowledge** and experience to promote a culture of innovation and initiative between supervisors;
- b) organising and endorsing the analysis of potential **development of tools** (promoting proof of concepts) chosen from the list identified by supervisors and considering the **criteria** and **objectives** described above, and to implement them after a positive decision following the analysis phase.

In addition to the objectives all the areas identified (and to be identified in future) should be assessed using the criteria summarised below:

- common interest and where enhanced cooperation and common work would be beneficial;
- real need identified by supervisors;

- whether EIOPA can add value through a centralised development or use of EIOPA's database;
- enhance the knowledge sharing and cooperation between NCAs.

To implement the process on analysing and the development of potential tools, the selection of ideas will start in the SupTech Forum, while their implementation will be performed by dedicated project teams that should involve the relevant Committees in the work under development. These teams should have knowledge from different areas: technical/business, data science and IT. The mandate of these teams will be to develop a proof of concept for each idea.

The implementation of this strategy should be coordinated with other relevant strategies such as the Data Strategy or the IT Strategy, as well as with the work performed by the ITF.

Once the ideas are identified, the implementation will follow a step-by step approach:

1. **Analysis phase**: This phase will be dedicated to increase the understanding of the idea, i.e. what is the objective of the tool, which input is needed, is all input needed available, which output is expected, how it fits into risk-based and proportionate supervision, as well as the increase of knowledge on the different technologies available, experiences already performed on the same or similar area, its possible applications and the processes to implement them. In this phase, EIOPA could sponsor a SupTech event where it cooperates with external stakeholders in developing specific FinTech proofs-of-concepts for financial supervision. The deliverable of this phase should be a recommendation to implement or not implement the tool analysed, including a budget.
2. **Planning and development phase**: This phase will be dedicated to plan and develop the projects chosen in the previous phase. The development can be internal, external or mixed, using new formulas like SupTech accelerators. Some NCAs already followed this approach.

The final result of the analysis phase will be presented to BoS, which will decide if the idea should pass to the planning and development phase. In each phase, a project can be cancelled by BoS decision. The BoS will also be responsible for the decision to analyse new ideas.

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[https://www.eiopa.europa.eu/browse/innovation\\_en](https://www.eiopa.europa.eu/browse/innovation_en)

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