Certain parts of this Chapter of the Supervisory Handbook have been omitted from the publication. These omitted sections contain confidential information that is integral to the effective functioning of the supervisory review process.

EIOPA SUPERVISORY HANDBOOK

Business Model Analysis including Digitalisation

The Supervisory Handbook recommends good practices to National Supervisory Authorities (NSAs) for the supervision of insurance and reinsurance undertakings and groups. The recommendations provided to NSAs through this Chapter should not be interpreted as legally binding nor as applicable in all cases to all undertakings and groups. When following the guidance from the handbook, NSAs are always expected to implement a risk-based approach, to use their supervisory judgment, and to take into account the specific risks and characteristics of each undertaking or group under their supervision.

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CONTENTS

INTRODUCTION

1.1. This Handbook sets out the key elements that National Supervisory Authorities (NSAs) are recommended to consider when assessing an undertaking's business model.

1.2. Assessing business models gives NSAs the opportunity to better understand the factors that create the opportunities and vulnerabilities in an undertaking's business and therefore, develop a more idiosyncratic and appropriate supervisory plan. As such the conclusions reached through Business Model Analysis (BMA) will be a useful input for the risk assessment and following supervisory actions.

1.3. BMA is a supervisory tool used in the licensing process of new insurance companies as well as in the ongoing supervision, it can be part of the regular Supervisory Review Process (SRP), triggered by an early warning for a specific undertaking, at the time of a merge and acquisition or when new products are about to be launched.

1.4. The process adopted by the NSA to carry out the BMA can differ in terms of being an integrated or separate approach (i.e., integrated into the risk assessment framework or approached as a separate project in itself), but the objectives and outcomes remain the same. The BMA process is similar in each case - the information assessed, the risks considered, and the outcomes should be consistent.

1.5. This document considers both the integrated and separate approaches to be examples of good practice.

1.6. For the purposes of the Supervisory Handbook, definitions are introduced to simplify the references and ensure consistency of terminology.

1.7. The handbook is divided into 4 different sections:

- Section 1 provides a brief overview of the basic BMA concepts, defines important terms, establishes the objectives of business model analysis, provides details on the two approaches identified as good practice which NSAs may use when implementing a business model analysis, including pros / cons and challenges and looks at the key steps of the business model analysis.
- Section 2 looks at digitalisation e.g. the level of innovation and innovation types, the changes in the different parts of the value chain, the implemented technologies and the digital business models.
- Section 3 provides quantitative and qualitative tools to be used in the business model analysis.

1.8. The approach outlined in this document can be applied equally to undertakings or groups.

SECTION 1: BUSINESS MODEL ANALYSIS

1.9. This section covers the following:

- Sub-section 1 provides a brief overview of the basic BMA concepts, defines important terms and establishes the objectives of business model analysis;
- Sub-section 2 provides details on the two approaches identified as good practice, which NSAs may use when implementing a business model analysis, including pros / cons and challenges;
- Sub-section 3 provides recommendations for the key steps that support the business model analysis process.

SUB-SECTION 1.1: BASIC CONCEPTS

Business model (BM)

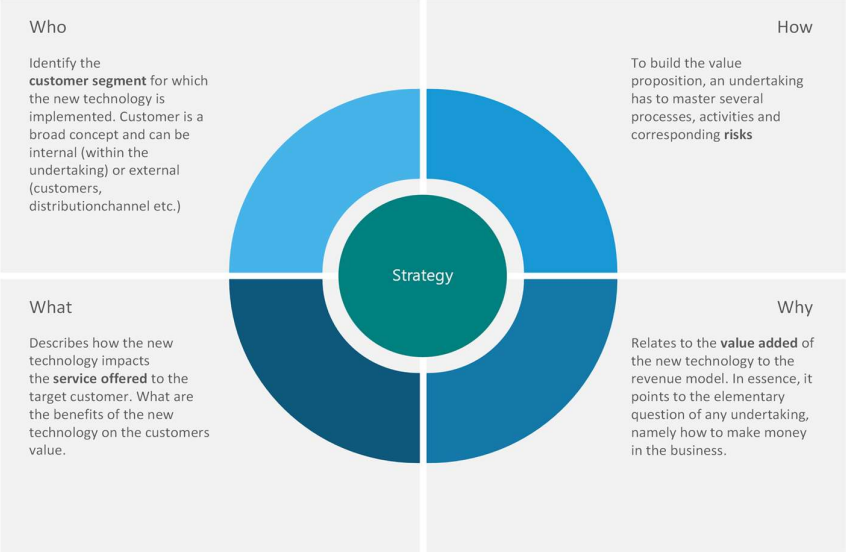
1.10. A business model is the means by which an undertaking generates value from its business. All business models share common characteristics, but each undertaking has its own specific model.

1.11. One of the approaches used to define a business model is the so called "who-what-how-why" approach. According to it, a business model defines who the undertaking´s customers are, what it is selling, how it is produced and distributed, and why the business is profitable and what risks the business model might entail.

1.12. From a practical perspective, a business model determines, amongst other aspects, the core products and/or services, marketing, distribution and sales strategies, business processes and policies and the interrelated architectural, co-operational, and financial arrangements with other entities in the value-chain (e.g. outsourcing and use of 3rd parties).

1.13. Another approach includes in the "who-what-how-why" model also the strategy, thus looking at the business model from the perspective of 5 elements. This is the approach taken also in this Handbook.

Figure 1: Impact of the business model (5 elements with a focus on digitalisation)



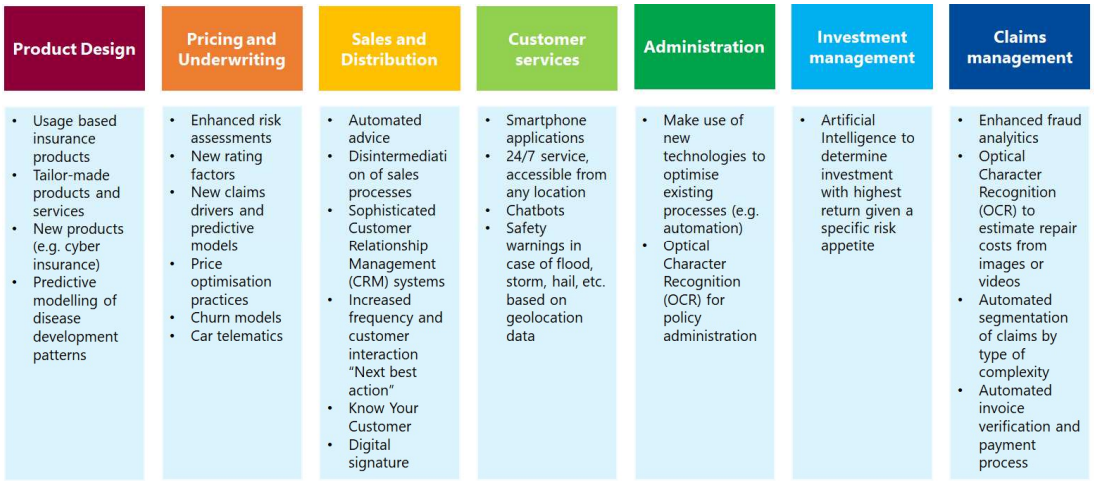
(Sources: "The magic triangle". The St. Gallen Business Model Navigator, O. Gassmann, K. Frankenberger, and M. Csik. St. Gallen, Switzerland, (August 2013))

Digital Business model (DBM)

1.14. Digital transformation is generating a wave of change across economic and financial sectors, affecting society at large. This transformation has many aspects. Digitally native InsurTech start-ups and broader technology companies (including the so-called "BigTech" companies) are entering financial markets with novel offerings, while incumbents are also transforming their value chains in light of digitalisation, moving towards innovative channels and products and as such changing their business models.

1.15. While the digital business models fit in the definition of the business models, there are some specificities that distinguish them. Companies with digitally oriented business models cope with the transformation of their business by use of innovation (e.g. platforms, apps, chatbots, cloud, data, AI etc.) and IT optimisations to systematically analyse, discover, create, deliver and capture value. In the area of insurance the digitalisation can involve the internet or other digital tools (e.g. cloud services or digital platforms) used to deliver insurance products and services to customers, as well as to manage other aspects of the business such as underwriting, marketing and sales, claims processing, and customer service. Through this process additional aspects are brought to the value chain like product adaptation to the specific needs of the customer (e.g. coverage, duration), customised pricing (e.g. premium determination correlating to the duration of risk exposure), 24/7 accessibility of the distribution channel and customer support. The added value can be identified across the different elements of the value chain, through business processes (in the back-end), improvement of stakeholder interaction, customer loyalty and creation of new opportunities through product innovation (at the front-end).

Figure 2: Examples of digitalisation in the Insurance Value Chain[1]



(Source: EIOPA)

1.16. There are different approaches and levels of innovation in the market. For incumbents, it is often observed that they use new technologies to enhance existing processes, products and services while, in some cases, InsurTech start-ups go further, trying to offer a fully digital experience to the consumer. Opportunities and risks on these different elements will be addressed in Section 2.

Business strategy

1.17. Business strategy refers to the choices that the AMSB (Administrative Management and Supervisory Board) makes in order to achieve its medium and long-term strategic business goals. The business strategy defines the business model, the critical success factors of the business model, and how it will adapt to individual circumstances.

Digital Business strategy

1.18. Digital business strategy refers to choices made and to be made by the AMSB of the insurance undertaking (incumbent or InsurTech) which defines the use of digital innovation within the business model. It could also include allocation of funding for future innovation research and development to be implemented as part of the digital business strategy within a digital business model.

1.19. A digital business strategy is a plan for an insurer to use digital technologies to conduct its business. This could involve a range of activities (either internal or through outsourcing/3rd party cooperation), such as developing or accessing online platforms for contracting and managing insurance policies, using advanced data analytics (e.g. Artificial Intelligence) to assess risk and pricing, implementing automation to streamline processes, or using social media and other digital channels to engage with customers.

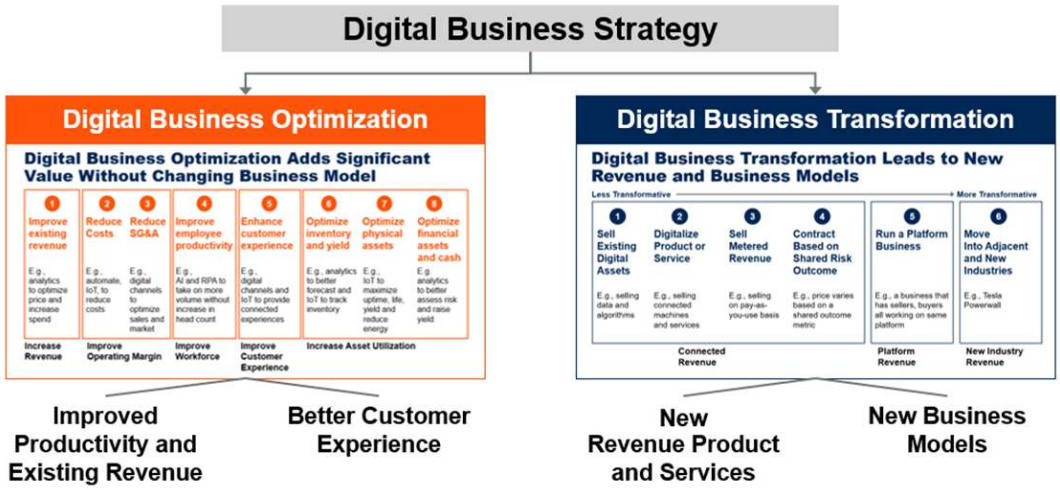
1.20. The goal of a digital business strategy is to improve the insurer's efficiency, reduce expenses and claims costs, increase business, income and financial return, or enhance the customer

[1] Based on: EIOPA, Discussion Paper on (Re)insurance Value Chain and New Business Models arising from Digitalisation

experience/retention. In some cases the digital business strategy can help the insurer to remain competitive in the market in terms of technology and meet the needs of younger generations e.g. Generation Z and Millenials.

1.21. There are two strategies towards digitalisation, which often overlap. The first one focuses on business optimisation and is often observed for incumbent insurers without a real change in the business model. The second strategy focuses on business transformation leading to a new business model as often developed by InsurTech players acting as insurance undertakings.

Figure 3: Types of innovation / strategy towards digitalisation



(Source: Gartner)

1.22. An undertaking can put in place different measures to implement its digital strategy such as by nominating an AMSB member responsible for developing the digital mindset, establishing a dedicated working group/committee responsible for digitalisation, launching specific projects or investing capital to drive innovation, engaging in partnerships with 3rd parties, having continuous training/education, etc. A full governance of the ICT (Information Communication Technologies) and data outsourcing and of partnerships is relevant to ensure implementing a safe digital strategy.

Business Model Analysis (BMA)

1.23. Business Model Analysis (BMA) is an assessment of the undertaking's business model and its sustainability both current and forward-looking, considering the undertakings strategy and risk appetite.

1.24. The primary objective of the BMA is to form a view of (a) the undertaking's current business model and its viability, understanding how value is created ("who-what-how-why") (b) how the model may evolve because of undertaking's strategic choices and (c) the forward-looking sustainability of the business model considering the impact of the changes (internal and external) to the business environment in which it operates.

1.25. Business Model Analyses can be performed differently by supervisors. It may be performed through a horizontal analysis where the business model of all insurance undertakings in the sector are analysed to assure that they are viable and sustainable or can be a focused analysis on the undertakings who are under a specific review given the riskier nature they might have. Lastly, event-driven analysis can exists which focus on a single undertaking for instance when applying for an insurance license.

1.26. During the business model analysis, the supervisors can detect early-stage strategies that may generate risks or uncertainties in the future. Among other risks, uncertainties may derive from the new technologies used in the digital business models as well as from business models that ignore the new technologies and the need for digitalisation.

1.27. It is recommended that BMA includes the supervisory view on the ability of the insurer to generate profit; while also considering future business sustainability and current and future key risks and vulnerabilities. BMA can be performed on different companies and at different levels of the organisation e.g. on a group-wide basis, on individual entities, intermediaries, business lines, ancillary service undertakings (for services related to insurance) etc.

1.28. Business Model Analysis is part of forward-looking supervision – it helps supervisors to explore how undertakings plan to earn profit, and what risks (both current and future) they take in doing so, what are the threats and opportunities. It helps to identify and tackle the root causes of problems in advance. Sustainable business models that demonstrate adequate profitability over long horizons are key to a sound insurance market.

1.29. Considering the above it is essential that the AMSB of the undertakings fully engage in deep understanding of the business models, and the prudential and conduct risks they carry.

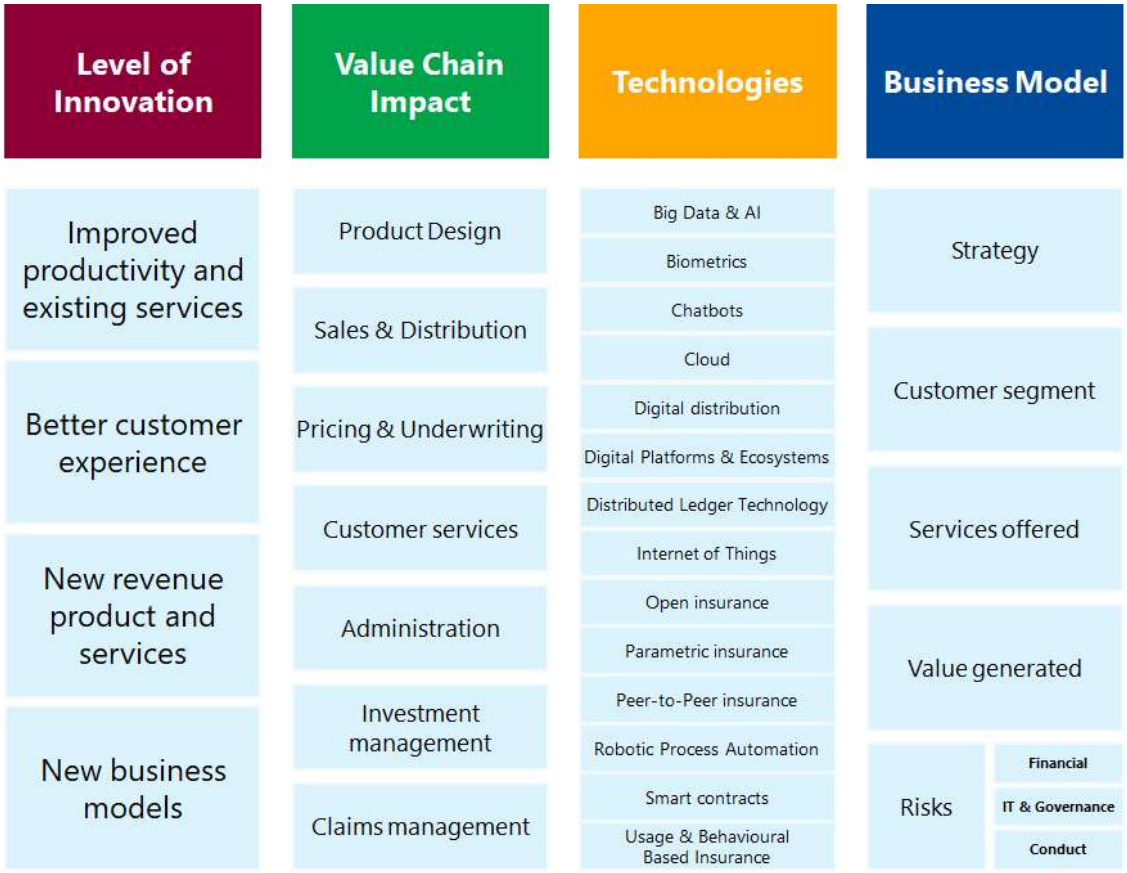
1.30. Specific conduct and prudential risks are typically inherent in any given business model and/or business strategy and its execution. Undertakings need to identify these risks, to implement effective mitigating and management actions, create adequate controls and regularly reassess the risks and management actions needed, as the business model itself or external factors evolve. (see Sub-section 2.5)

1.31. In order to make supervision more effective and support the BMA when digital aspects are at stake, supervisors need to better understand in general the new technology-lead business models/strategies as well as the risks and opportunities they involve[2].

1.32. In case of digital business models, it is recommended that the BMA also focuses on understanding the level of digitalisation of the business model (using Figure 3's framework) and its impact on the overall insurance value chain. For this purposes the NSA should identify which digital tools impact which parts of the insurance value chain. (see Figure 2) These different aspects are considered as different dimensions of innovation and are included in Figure 4.

[2] https://eusdfa.eui.eu/

Figure 4: Dimensions of innovation considered in the digital business model analysis



(Source: EIOPA)

Supervision of a digital business model

Considering the specificities of the digital business model, NSAs are recommended to note that some risks are amplified for undertakings with a more digital business model.**Supervisory outcome**

1.33. The BMA is a key supervisory tool used in the SRP that helps to ensure undertaking's safety and soundness. It is used in the assessment of the undertaking's viability (ability to generate adequate returns with an acceptable funding and risk appetite over the short term) and sustainability (ability to generate acceptable returns assessing the undertaking's risk appetite and strategic decisions over the medium and long term). BMA also involves evaluating whether the business strategy is adequately resourced, understanding the risks arising from an insurer's business model (including substitutability of services provided and their providers), and determining whether they are adequately managed (see Sub-section 1.3).

1.34. The BMA must ensure compliance with legislation, while guaranteeing the observance of ethical principles and values, which must be respected during the development, implementation and use of business models.

1.35. The "digital ethics"[3] in the area of digitalisation imply the concepts of fairness, non-discrimination, ethically aligned design and corporate digital responsibility for mitigating risks posed implicitly or explicitly by the use of digital technologies and data by companies.

1.36. The supervisor-undertaking dialogue during the BMA should improve, on the one hand, the NSA's understanding of the undertaking's business model vulnerabilities and, on the other hand, help the undertaking to understand better the supervisory expectations.

Challenges in conducting a business model analysis

1.37. There are a number of challenges to consider in conducting a BMA:

a) Stakeholder collaboration: effective delivery of BMA may involve collaboration between supervisors and the undertaking's AMSB and senior management and in some cases with relevant third parties. This can run concurrently with the on-going supervisory reviews.

b) Group perspective: There are number of issues to consider when performing a BMA for a Group, including: transferability of capital (also with regard to the dividend policy), strategic accountability at different levels of the governance structure (including degree of independence for subsidiaries) and issues related to non-equivalent regulatory jurisdictions (such as Groups with third country branches and subsidiaries). In some instances, the group perspective might be broader e.g. insurance groups that are part of financial conglomerates and/or Mixed Activity Groups (groups active in both financial and digital services e.g. Amazon which also serves as an insurance broker).

c) Resource intensive: If well scoped, the process doesn't need to be resource intensive. Initial investment in understanding the undertaking does not need to be repeated in full at each iteration of the BMA.

d) Skill availability: (Digital) BMA requires dedicated IT and ICT risk management skills and understanding of the new technologies and business models. These skills need to be continuously developed and enhanced.

SUB-SECTION 1.2: APPROACH TO BUSINESS MODEL ANALYSIS

1.38. There are two main approaches to performing a BMA:

- Integrated BMA - considers BMA as a part of the Risk Assessment Framework (RAF) and is performed as part of a well-structured risk assessment process. The outcome of the analysis is used to assess risks defined in the RAF to which the undertaking is or could be exposed to and give input to the risk assessment.
- Separated BMA - considers BMA as a separate supervisory activity from the RAF. In this case the BMA is performed as a single process that supports other aspects of the SRP, especially through the identification of key risks and vulnerabilities associated with the business model.

[3] Artificial Intelligence governance principles: towards ethical and trustworthy Artificial Intelligence in the European insurance sector (europa.eu)

SUB-SECTION 1.3: KEY STEPS OF THE BUSINESS MODEL ANALYSIS[4]

1.39. The key steps that comprise good practice in relation to the BMA process are the following:

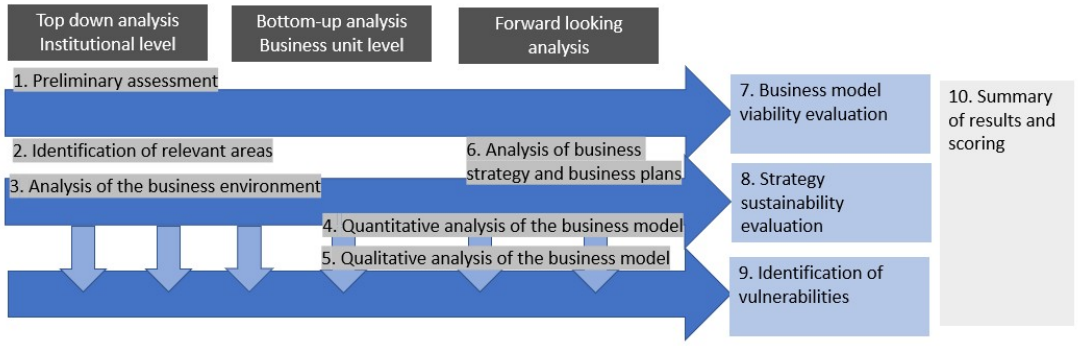
1) Preliminary assessment
2) Identification of relevant areas
3) Analysis of the business environment
4) Quantitative analysis of the current business model
5) Qualitative analysis of the current business model
6) Analysis of business strategy and business plans
7) Business model viability evaluation
8) Strategy sustainability evaluation
9) Identification of vulnerabilities
10) Summary of results and scoring

1.40. In practice it is expected that many of the steps above will occur concurrently. In addition, depending on the focus of the analysis in some cases it may be necessary to conduct only some of the steps.

1.41. In all of the steps NSAs are recommended to make use of all available data/information of different sources. Use of good, reliable data/information is imperative in order to back-up assumptions and raise credible challenge.

1.42. Considering, the specificities of the digital business model, NSAs are also recommended to analyse roadmaps for implementing and scaling up new aspects of a business model (including digital technologies).

Figure 5: Steps of the Business Model Analysis



(Source: EBA and Business model analysis, an essential management tool 2017 – www.managementsolutions.com)

[4] Business model analysis, an essential management tool 2017 – https://www.managementsolutions.com

1. Preliminary assessment

1.43. In this stage the supervisors decide which BMA will be performed, which undertakings will be covered and which activities products and business will be in scope. This step might deviate considering whether the BMA is to be performed for the first time, based on the undertaking's riskiness or as part of a regular review or a licensing procedure.

1.44. The level of detailed analysis work during the BMA should be commensurate with the nature, scale, and complexity of the risks the undertaking faces or could face and the impact they could have on policyholders. To identify the undertakings with high business model risk NSA's could perform a scoping analysis considering the macroeconomic environment based on high-level quantitative and qualitative data, the guaranteed rate for Life and Health business, the level of investment yields, combined ratio, expense ratio or the Gross Written Premium (growth), the usage of more innovative technologies (e.g. Artificial Intelligence), cooperation with third parties, diversification in terms of asset classes or insurance products etc.. All these factors give insight in the adequacy of the undetaking's strategy. This data can be compared across peers and serves to determine the scope of the analysis.

1.45. Additional information that the NSAs might consider when identifying the undertakings is the outcome of any thematic reviews – e.g. a sector-wide analysis may reveal common underlying issues that prompt additional undertaking-specific analysis and/or an outcome of any previous supervisory findings. Market changes – e.g. significant market entry/exits or market structural features or/and time since previous assessment - are other factors to be considered.

1.46. Peer group analysis may be considered for lower impact undertakings to assess the vulnerability of similar business models to common events. Great care needs to be taken when selecting peers and comparing data to ensure that they are done on an equivalent basis. When defining the frequency or the intensity of the regular BMA, the NSA could consider that high impact undertakings will typically require higher frequency review compared to the low impact undertakings. In addition, external events (e.g. portfolio transfers) might trigger additional business model analyses for a given undertaking. The level of digitalisation and associated risk within an undertaking's business model as well as other factors might impact the frequency of the assessment.

1.47. Once the undertakings for the BMA are identified the next step is to identify the scope of the analysis e.g. concrete activities, LoB, new product etc.

2. Identification of relevant areas

1.48. The scope of the BMA might be full or dedicated to a specific area. In the latter it would be more appropriate to review whether prior judgements are still valid and then update the analysis work as appropriate.

1.49.

3. Analysis of the business environment

1.50. This step is key and focuses on analysis of the current and future business environment.

1.51. Understanding the current and forward-looking economic and operating environment is important for the BMA. NSA are recommended to assess the macro-economic situation the undertaking is facing and assess its strategic plans and financial forecasts.

1.52. NSAs are recommended to form a view on how the business model may evolve as a result of strategic choices made by the undertaking in response to the impact of changes to the business environment in which it operates.

1.53. In particular, in the context of BMA of new undertakings, NSAs are recommended to also consider the overall investor sentiment in the area of start up financing and venture capital, as they might be more dependent on further financing in the future. For new digital players, it is important to assess to what extent a failure is possible if the business model is not viable or sustainable (e.g. InsurTech such as B3i already entered insolvency given that the InsurTech was not able to raise new capital).

4. Quantitative analysis of the current business model

1.54. NSAs are recommended to make a quantitative analysis of the business model, analysing undertaking's financial result, financial foreasts, its risk appetite and performing a peer group comparison (see Section 3).

5. Qualitative analysis of the current business model

1.55. NSAs are recommended to make a qualitative analysis of the business model, analysing the main key success factors and main dependencies (see Section 3).

6. Analysis of strategy and business plans

1.56. NSAs are recommended to make a quantitative and qualitative analysis of the undertaking's strategy and business plans aiming to understand the business plan assumptions and evaluate how the strategy as well as the associated risks might evolve in the context of the business environment.

1.57. As a result of the assessment of the strategy, NSAs are recommended to be able to form a view on:

a) target customers;

b) market share targets;

c) preferred product lines;

d) process for developing the strategy and assessing / implementing innovative technologies;

e) the methodology of back-testing/validating the strategy or assumptions.

1.58. In evaluating an undertaking's exposure to strategic risks, NSAs are recommended to consider the following:

a) validity, consistency and clarity of the strategy;

b) evidence of the undertaking's risk awareness and management of strategic risk; and

c) the process adopted for development of the strategy and decisions made

d) change strategy management process in face of changes in the business environment.

7. Business model viability evaluation

1.59. NSAs are recommended to assess the undertaking's ability to generate sufficient returns over the short to medium term.

1.60. In order to assess the viability and sustainability of an undertaking's business model NSAs are recommended to use the output of the quantitative and qualitative forward-looking analysis of the financial projections (see steps 4 and 5).

1.61.

1.62. A judgement on viability can be made once an understanding of the business model's vulnerabilities and risks has been reached and it is clear what mitigants the undertaking has in place to manage the exposure towards them.

8. Strategy sustainability evaluation

1.63. NSAs are recommended to assess the undertaking's ability to generate sufficient returns over a longer period. Or, if the undertaking just recently entered the market, NSAs are recommended to assess if profitability can be reached within a reasonable amount of time. It is also important to assess profitability when a shift in the generation of the clients is observed, a business model profitable for clients from the "baby boomers" generation may not be so for "millennials" and other digital native generations for example. In such cases, the assessment of the business plan should account for longer periods to assess for instance the impact of ageing of customers.

1.64. A judgement on sustainability, similar to viability, can be made once the vulnerabilities and risks for the BM are known and it is clear what mitigants the undertaking has in place to manage the exposure towards them.

1.65.

1.66. NSAs are recommended to form a view on the strategy, strategic risks and whether they are addressed in the business strategy. In evaluating the medium-term business model or financial projections, NSAs are recommended to bear in mind that this is the undertaking's view of its own business model development.

a)

9. Identification of vulnerabilities

1.67. NSAs are recommended to apply BMA to support the identification of the undertaking's key vulnerabilities, exposures most likely to impact materially the undertaking or lead to its failure on a forward-looking basis.

1.68. In doing so NSAs could consider scenarios/events which might cause serious problems to the undertaking. It is often useful to think about the 'margin of safety' that an undertaking has.

1.69. The identification of vulnerabilities is a matter of judgement, based on extensive quantitative and qualitative assessment of the business model as performed in the previous steps.

1.70. The NSAs are recommended to consider risk mitigating actions and the possibility that residual business model risk might still exist if these actions are not complete or sufficient to address all elements.

10. Summary of the results and scoring

1.71. NSAs are recommended to focus their attention on the outputs of an undertaking's business model (such as profitability, impact of digitalisation etc.). Ultimately, the BMA process is assessing the viability and sustainability of the undertaking's business model, rather than the undertaking's processes.

1.72. When assessing the financial performance, NSAs are recommended to assess the external pressures and targets under which the undertaking is operating (for example, shareholders demands, funding, debt servicing costs, liquidity, capital expenditures, profitability, premium growth, operational expenses, disintermediation, fragmentation of the value chain etc.) and consider the impact these factors might have on the undertaking's behaviour.

SECTION 2: DIGITALISATION

SUB-SECTION 2.1: INTRODUCTION

2.1. As indicated in Section 1, digital technologies are having a material impact on the insurance market while also affecting the business models of insurance undertakings both incumbent and new regulated undertakings following innovative/digital business models (InsurTech companies).

2.2. Digitalisation should be perceived as an instrument to enhance a business model and not as a means on its own. Therefore, it should be avoided to label undertakings as digital versus traditional while the focus should be on the result of the digitalisation used.

2.3. This impact of digitalisation is visible through multiple dimensions such as:

1) Level of innovation and innovation types (implying a moderate to strong impact on the business model);
2) Changes in different parts of the value chain and how the innovation will generate new value for the undertaking and the consumer;
3) Technologies implemented to drive the innovation (bringing specific opportunities and risks) and governance of the IT outsourcing and partnership agreements;
4) Digital business models – Strategy, customer segments, services offered, value generated and risks observed.

These dimensions are reviewed in detail in the rest of this section.

SUB-SECTION 2.2: LEVEL OF INNOVATION AND INNOVATION TYPES

2.4. InsurTech refers to technology-enabled innovation in insurance that could result in new business models, new applications, new or improved processes or products with an associated material effect on the provision of insurance products and services.

2.5. The authorisation of InsurTech undertakings in most cases is granted according to the principle “same risk, same rules, same regulation” i.e. in the same way as traditional insurers, also observing the principle of proportionality. Given the principle of technological neutrality the extent to which a ‘digital’ business model is in place or is planned, or whether an undertaking uses specific technologies is not in itself a basis for supervisory differentiation. The nature of the products or services that shall be offered and the risks inherent in the business of the undertaking are the relevant elements to be taken into account.

2.6. Indeed, different risks and opportunities, both from an undertaking and consumer perspective need to be considered.

2.7. In the InsurTech ecosystem supervisors are recommended to be aware of the existing different players:

- Technology providers (Tech or BigTech): companies offering specialised services (IT or other technology-driven services, such as data services), e.g., cloud services, digital platforms, providers of optical recognition tools or health monitoring etc;
- Insurance intermediaries: undertakings active as insurance intermediaries that use their technological expertise to distribute insurance products as well as participate in the product design and development (can also be BigTech with an intermediairy license);
- Insurance undertakings : insurance undertakings authorised under Solvency II or a similar national regime, following innovative/digital business models since inception (InsurTech) and traditional, incumbent insurance undertakings.

2.8. InsurTechs are innovating the insurance sector, but many incumbents are also effectively innovating through a variety of approaches and a shift in business vision to better align with consumer preferences, while having a forward-looking perspective.

2.9. Insurance undertakings do not always have the necessary IT knowhow for innovative solutions, while it is expected that InsurTechs have the knowledge but in reality might lack the necessary historical data to develop, test and scale their products and services. However, it should be noted that this is a common issue affecting all start-ups, including traditional insurers which are recently licensed.

2.10. The way insurance companies are using innovation and new technologies can be analysed from many different perspectives. In this Chapter we use Gartner's approach and its definitions (see Figure 3) according to which there are 4 different types of transformational innovation in insurance, depending on the level of change in the business model:

- Improved productivity and existing revenue: where digital technologies are used to optimise existing business processes (e.g. by means of robotic process automation mainly for incumbents);
- Better customer experience: where digital technologies are used to enhance the communication and interaction with customers and to improve existing products and services (e.g. digital platforms and ecosystems used mainly by incumbents);
- New revenue products and services: where digital technologies are used to provide new insurance products or customer services (e.g. usage- and behavioural-based insurance used mainly by InsurTechs);
- New business models: where digital technologies facilitate the creation of completely new and digital business models (e.g. parametric insurance, smart contracts, offering of advisory, ancillary services mainly by InsurTechs).

2.11. Insurance undertakings may follow one or more of the types of digital transformation above. The way supervisors perform a business model analysis will vary depending on the digital approach taken by each undertaking.

2.12. When companies decide on their digital transformation they base their decision on the current business model, the needs of their customers considering the customer structure, the competition in the market, the legal framework, and the general business strategy. Based on these factors, the undertaking decides whether to optimise its current business model or to transform it. Depending on the decision, the goals and the approaches to be taken will be different. For example, in a process of optimisation the undertaking might seek to reduce the cost

of sales, improve the revenue, optimise the employee's productivity, while in a process of improving new revenue products and services the undertaking might launch a new digital product.

2.13. Regardless of the approach taken the undertakings will need to decide on the strategic digital priorities e.g. whether to focus on generating new revenue, excel in customer experience, achieve operational excellence or minimise risks or decide not to engage in a digital transformation. Situations where an undertaking has not performed this analysis and has not taken an informed decision at the level of the AMSB on whether to engage in a digital transformation strategy or not should be considered a potential warning sign in the business model analysis.

SUB-SECTION 2.3: CHANGES IN DIFFERENT PARTS OF THE VALUE CHAIN

2.14. Assessing the risks and benefits of the new digital technologies during the business model analysis requires comprehensive understanding of the new technologies available, knowledge of the insurance value chain and systematic evaluation of the potential advantages and disadvantages of the changes brought by the new technologies to the value chain and to the insurer's business model and strategy.

2.15. In Section 1 we already outlined the changes that new technologies can bring to the insurance value chain (see Figure 2).

2.16. The assessment of the business models provides NSAs with an opportunity to better understand the factors that create opportunities and vulnerabilities in an undertaking's business and therefore, adapt their supervisory plans to the digital transformation of the undertaking and/or its new digital business model.

2.17. As part of the assessment, NSAs are recommended to identify which digital tools and technologies already in use or planned to be used impact which parts of the insurance value chain. In addition, NSAs are recommended to gather a full view on the new technology-led business models/strategies, the risks they involve, and whether such business models/strategies will be sustainable in the longer term.

2.18. Once the NSAs identify the changes caused by the new technologies they can further look at the different levels of risk, at the viability of the business model and at the sustainability of the insurer's strategy.

Identification and assessment of the new technologies in insurance

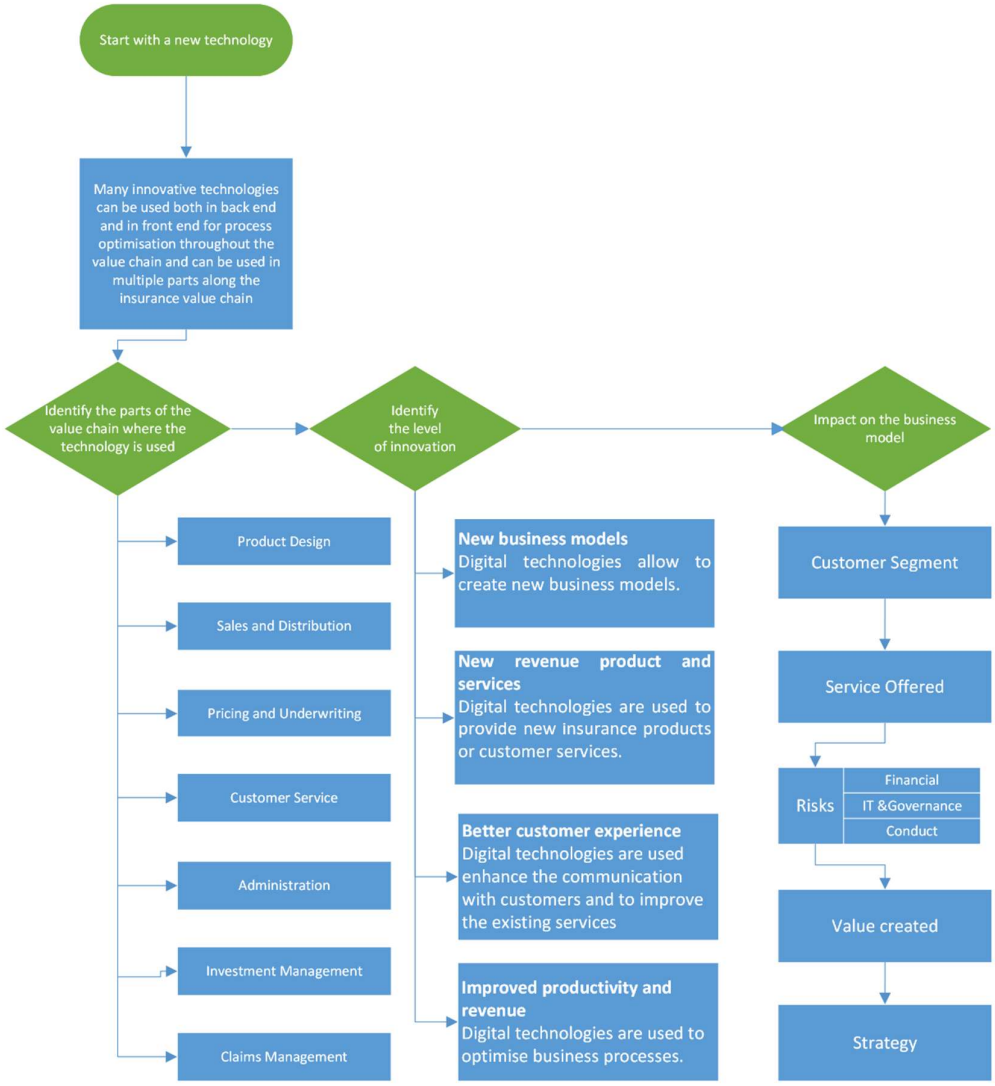
2.19. Many innovative technologies can be used in multiple parts along the insurance value chain (see Paragraph 1.15 and Figure 2) both in back end and in front end processes optimisation. The analysis of the impact and the level of risk of the new technologies on the business model involves the following steps (summarised in Figure 6):

- Identification of the new technology, e.g. anything from a new software platform, use of Internet of Things (IoT) to gather data, new data analytics tool, including the use of machine learning or Artificial Intelligence or introduction of a new parametric product amongst others via Distributed Ledger Technologies (DLT) and smart contracts.

- Understanding the different stages of the insurance value chain where the technology could be, will be or is implemented. It is possible that a technology can be implemented through multiple parts of the value chain, making it more difficult to assess who is in control and who takes the responsibility.
- Objective of the innovation; will or is the technology used to improve the internal efficiencies (improved productivity and better customer experience), or used to reach out to new customers, markets, goals or create new opportunities (new products or new business model).
- Evaluation of the impact of the innovation on the overall business model, evaluation of the benefits and risks associated with the technology, such as financial risks, IT security and cyber risks, operational risk, data governance, third party risks, legal, regulatory risk or conduct of business risk. This step follows the "who (Customer segment) – what (Service Offered) – how (Risks) – why (Value created) - strategy" framework, as seen in Figure 6.
- Evaluation of whether the change under assessment and the use of the technology needs supervisory attention in a business model context[5] by considering the impact on (future) earnings and (future) investments or from a risk management perspective by considering the new risks identified.

[5] New technologies could also have impact on other financial and non-financial risks, can impact business operations (operational and IT risks), financial results (prudential risk) or impact the consumers (conduct risk).

Figure 6: Framework for assessing new technologies in insurance



2.20. The internal governance of the undertaking should reflect the nature, scale and complexity of the risks resulting from (material) use of new technologies. For instance, the governance framework applicable to a business process may in some cases be maintained, while in other cases it will have to be updated before putting the new technology into production. It will have to be tested whether the governance is adequate or needs to be adapted. For example, the use of Artificial Intelligence (AI) in pricing insurance gives many opportunities but adds also risks to consumers and the undertaking and these risks must be mitigated by good risk management and governance.

Special consideration regarding the system of governance is needed when Artificial Intelligence[6] is used in certain use-cases.[7]

[6] At the time of finalising the document, the AI Act is still being finalised. Please refer to the Official Journal of the European Union for the published texts.

[7] For more information on the needs of the System of Governance please consider the Report from EIOPA´s Consultative Expert Group on Digital Ethics in insurance on "Artificial intelligence governance principles: towards ethical and trustworthy artificial intelligence in the european insurance sector." https://www.eiopa.europa.eu/document/download/30f4502b-3fe9-4fad-b2a3-aa66ea41e863_en?filename=Artificial%20intelligence%20governance%20principles.pdf

Sub-section 2.4 Implemented technologies to drive innovation

2.21. Undertakings might use a wide range of new technologies to drive innovation in their processes and their products/services. Some of the most innovative technologies are briefly presented in this section, aiming to give supervisors an overview of their essence and how they can be used in insurance:

- Open Insurance
- Internet of Things
- Artificial Intelligence
- Distributed Ledger Technology / smart contracts
- Big Data
- Robotic Process Automation
- Digital Platforms and Distribution.

2.22. The aim of this section is to provide a basic knowledge of the technologies while identifying some opportunities and risks. The section does not aim to be exhaustive on the risks identified as this is to be tackled in different tools addressing the supervison of the use of such technologies. The basic information provided here intends to support the business model analysis only. When other documents from EIOPA are relevant for the supervision on some technologies that is identified.

Open Insurance

2.23. There is no uniform definition of an open insurance or open finance. EIOPA has considered open insurance in its work so far in the broadest sense, covering products and/or services based on accessing and sharing insurance-related personal and non-personal data usually via Application Programming Interface (APIs).[8]

2.24. Cooperations between Techs/BigTechs and incumbent insurance undertakings/Insurtechs or insurance intermediairies are often established and facilitated by the use of APIs. An API is a set of functions and procedures allowing the creation of applications that access the features or data of an operating system, application, or other service. Basically, an API specifies how software components should interact[9]. API allows to transfer data between the IT infrastructures of the different parties without the need to develop multiple interfaces for different undertakings.

2.25. Open insurance (or in an even broader sense open finance) is one of the new technology-driven development that could potentially affect the value chain of insurance undertakings, intermediaries and third party service providers. Adapting the experiences from the banking sector (open banking), the concept of open insurance aims for common use of structured data to potentially enhance the development of innovative products, distribution channels etc. One basic requirement is the provision of standardised data sets by the insurance undertakings. Depending

[8] At the time of drafting the chapter of the SRP Handbook on digital BMA, the proposal of the European Commission on FIDA was not yet finalised. Please refer to the Official Journal of the European Union for the published texts.

[9] EIOPA, Open Insurance: Accessing and Sharing Insurance-Related Data

on the use case, the provision of (personal) data is also required by the insureds or persons who are interested in specific insurance products.

2.26. However, this could give rise to new or amplified risks and challenges such as data security, cyber risks, interoperability, liability and consumer protection. Therefore, it is recommended to promote coherence with overarching objectives of consumer protection, financial stability, market competition, market integrity and sound prudential regulation (see Sub-section 2.5. on risks).

2.27. It should be noted that the broader application of concepts in relation to open insurance also comes with certain risks for customers as well as for the insurance industry and their business models, including enhanced competition and introduction of new players in the value-chain and potentially new services being offered to consumers.

2.28. Currently there are no specific legal provisions of mandatory open insurance, however relevant data acts already approved or under discussion should be considered as well as COM proposal on the Financial Data Access Act (FIDA) under discussion.

Internet of Things

2.29. Internet of Things (IoT) is commonly understood to represent the network of physical devices, such as vehicles, home appliances, gadgets and other items embedded with sensors, software, and connectivity, that enable these objects to connect and exchange data. Those devices are often used in mobility (car black boxes; toggles etc), smart homes, smart cities, industry, healthcare, and other applications and can be used for a wide range of purposes, such as automation, monitoring, analysis, and control, with the goal to generate data that can then be used to improve efficiency, reduce waste, enhance safety, and provide new insights into the users' behaviour. They can be controlled remotely and can often be programmed to respond to specific conditions or triggers, often providing "live" access to the data. IoT data could help insurance companies to improve their risk assessment and management capabilities, reduce costs, and offer more personalised and responsive services to their customers. Examples of the way IoT data are used in the insurance industry include[10]:

- Car telematics: Insurance companies are using IoT sensors in vehicles to collect data on driving behaviour, such as speed, distance, and acceleration. This data can be used to personalise insurance policies, offer discounts to safe drivers and enable implementation of the "pay-as-you drive" principle. Also, the premium can be influenced by behavioural factors such as driving style (aggressive vs passive) or driving habits (day vs night, traffic conditions, etc.). Similarly, there are products that offer insurance where the premium is calculated either when the vehicle is being used and/or when the user enables the coverage and/or the consumer offers part-time parcel delivery and courier services ("pay-as-you-drive").
- Home monitoring: IoT sensors can be installed in homes to monitor temperature, humidity, and other factors that could lead to damage, so to detect potential risks such as water leaks, fires, or break-ins. Insurance companies can offer discounts to customers who install these sensors, and use the data collected to adjust premiums based on the risk profile of each customer. Examples can be found in P&C insurance where the added value can be generated through warning systems that trigger the response of e.g. ambulance, firefighters, police but can also generate data that can be used to determine liability.

[10] EIOPA, Big Data Analytics in Motor and Health Insurance: A Thematic Review

- Health monitoring: Wearable devices and gadgets can be used to monitor the health and wellness of insurance customers. This data can be used to incentivise healthy behaviour, adjust premiums based on risk factors, and even prevent health problems before they occur. They can also be used as a warning system to ensure the information on extreme situations is delivered to designated persons (e.g. family members, ambulance, etc.).
- Claims management: IoT devices can be used to collect data on the extent of damage to insured assets, such as homes or vehicles and as such speed up the claims process and reduce the likelihood of fraudulent claims.
- Parametric insurance: the combination of Internet of Things with Distributed Ledger Technology can be used for parametric insurance (see Paragraph 2.52 and following)

2.30. When considering IoT, the main risks are data privacy, reputational risks and operational risks such as the normal functioning of the device including provider sustainability, network coverage, battery consumption (if rechargeable), device dependencies (interconnections to other IoTs devices that also represent all the mentioned risks). Another very important risk is the fair treatment of customers, in particular between the ones that make their data available and the ones that do not wish to do so and the risk of the data shared leading to identification of high risks, leading to unsurability of some risks or very high premiums. Ultimately both can lead to financial exclusion. During product development privacy by design and by default principles have to be applied to ensure that only data needed for the purposes that were clearly communicated to the customer are collected. IoTs will in most cases include outsourcing, be it from the software or hardware side, leading to third party risk. As the service provided implies insurance coverage throughout the contract term the interchangeability of the provider, taking into account protection of intellectual property could represent a challenge and has to be considered during an outsourcing analysis by the insurer. Dependency on technical prerequisites such as network coverage, device sharing, battery consumption, device dependencies etc. must be considered as the functioning of the insurance product depends on the normal functioning of the device collecting data and its ability to transmit it. As a result of those independencies, it is needed to foresee all situations where the normal functioning is not achieved so the customer would know the implications to insurance coverage.

2.31. Usage based insurance would generate greater competition between InsurTechs and incumbents offering this product, compared to traditional players. At the level of the undertaking using it, it could expect to increase premium income but it is important to monitor if the pricing is adequate to the risk over time, i.e. assess if the data collected via IoT has in fact a strong correlation with the risk. Also, additional costs could be sustained by the insurance undertaking for managing the devices, data and analytical tools, which can potentially be incorporated in the premium.

2.32. For behavioural based insurance, the data from Internet of Things is taken one step further and, for instance, the acceleration data of the car is used to gain greater insight to the riskiness of the behaviour of the consumer. This allows better differentiation between good and bad risks and as a result improves pricing, with riskier policyholders having to pay higher premiums. This would also allow the insurer to potentially accept certain risks or offer a lower premium to drivers which the IoT allowed to identify as less risky. However, IoT data would allow a distinction between the good and bad risks in the population of young drivers, enabling the insurer to underwrite more policyholders than it might have done previously. This improved pricing and underwriting can therefore lead to higher premium income and higher profitability, but it is important to monitor

if the pricing is adequate to the risk over time, i.e. assess if the data collected via IoT has in fact a strong correlation with the risk. A wrong algorithm used for all customers may represent significant under-pricing and lead to significant losses. Once more, the concept of mutualisation is at risk as the risk of the data shared leading to identification of high risks may result in unsurability of some risks or very high premiums, ultimately resulting in financial exclusion.

2.33. In the context of behavioural based insurance, it is also observed that undertakings use this data for loss prevention purposes. Two use cases can be noted here. For instance, health and home monitoring can indeed be used to measure the health and safety of an individual or its house. If e.g. a fire is detected smart sprinklers systems can be used to extinguish them or alert the emergency services. This would indeed lead to a reduction in expected claims costs. However, undertakings also use car telematics to gain insight on the behaviour of a policyholder and incentivise them to adjust their behaviour. For such loss prevention measures, it is observed that a short-term benefit exists, but experience in some jurisdictions show that in the longer term the consumers behaviour might regress. A longer-term impact of such loss prevention measures is therefore not guaranteed. In some cases, insurance undertakings which do not offer usage or behavioural based insurance might ultimately lag behind and lose market share in a more tech-savvy-customer segment or it could also be observed that the bad risks are concentrated in the undertakings not using behavioural based insurance.

Artificial Intelligence

2.34. Historically, insurance undertakings made use of traditional statistical or actuarial techniques for pricing, underwriting or claims management purposes. However, with the advent of artificial intelligence it is observed that undertakings make use of more advanced and complex techniques.[11,12,13,14]

2.35. Artificial intelligence concerns new statistical techniques which are increasingly based on machine learning algorithms. The distinction from traditional techniques lies in the fact that these algorithms could be automated and unsupervised and as such can lead for example to less control from the undertaking on how the pricing is achieved. In addition, it is often observed that artificial intelligence can lead to improvements for underwriting and segmenting policyholders since these techniques are better able to distinguish between the risk levels of different consumers.

2.36. The use of Artificial Intelligence in all the areas of the insurance value chain raises both opportunities and risks/challenges. Among the main opportunities are:

- more efficient and automated processes;
- higher prediction accuracy;
- more personalised products and services.

2.37. Some of the risks/challenges arising from the use of Artificial Intelligence are:

[11] EIOPA, Big Data Analytics in Motor and Health Insurance: A Thematic Review
[12] EIOPA, Supervision of Machine Learning algorithms
[13] EIOPA, Artificial Intelligence Governance Principles: Towards Ethical and Trustworthy Artificial Intelligence in the European Insurance Sector - A report from EIOPA´s Consultative Expert Group on Digital Ethics in insurance
[14] At the time of finalising the document, the AI Act is still being finalised. Please refer to the Official Journal of the European Union for the published texts.

- AI ethics and the need to comply with governance principles including:
  - Transparency and explainability issues;
  - Proportionality
  - Fairness and non-discrimination
  - Data governance of record keeping
  - Robustness and performance
  - Human oversight and validation
- the potential underwriting risks of some AI use cases leading to an unsustainable business model (e.g. the lack of transparency and explainability of the AI resulting in accepting higher risks than expected);
- limited financial inclusion or even financial exclusion of high-risk of vulnerable consumers or of customers not willing to share personal data.

Figure 7: Overview of the Artificial Intelligence Governance Principles

(Source: Artificial Intelligence Governance Principles by EIOPA´s Consultative Expert Group on Digital Ethics in insurance)

Some most common AI use cases[15]

2.38. Artificial Intelligence associated with Optical Character Recognition (OCR) or image recognition allows processing of documents quickly, thus leading to efficiency gains. Furthermore, image recognition can also be used in claims management. A policyholder can be asked to send a picture of the car accident which can be interpreted by the AI to obtain a first estimate of the claims cost. This facilitates the management of smaller claims, allowing undertakings to focus their resources on larger claims thus reducing claims handling expenses. Furthermore, some undertakings are also starting to make use of speech, emotion and voice print recognition.

2.39. Some undertakings offer specific customer services such as access to digital platforms (e.g. aggregator apps). They can be combined with artificial intelligence to detect which types of

[15] The examples are not exhaustive as the area is rapidly developing

insurance are not yet used by the policyholders and would be useful for them. Also, the occurrence of life events can be used to offer new products and enhance sales and distribution.

2.40. Artificial Intelligence is often based on complex machine learning techniques (e.g. supervised learning, deep neural networks etc.) which may have a black-box nature. For traditional techniques, the structure of the model explains intuitively how an estimate e.g. of a premium was made. However, AI techniques are often more based on specific algorithms and may not have a specific structure between e.g. the premium and the risk drivers. Undertakings would therefore calculate a premium using AI without being able to explain which risk drivers are impacting the result. This can create explainability and transparency issues or similar challenges (depending on the use case) for the undertaking when it needs to explain different premiums for policyholders with the same risk profile. The differences in the premiums calculated by AI models with lower explainability and transparency in some cases may lead to discrimination.

2.41. Artificial Intelligence is in some cases also used for underwriting and risk selection. The same explainability and transparency difficulties can in such cases lead to acceptance of risks which are not in line with undertaking's underwriting policy and can lead to a decrease in profitability or loss in premium income.

2.42. Furthermore, given the increased ability of AI to distinguish between different risks, higher differences in the premiums for more vulnerable consumers can occur. This can even be enhanced if elasticity models are used. These models assess whether a policyholder is sensitive to price changes and are used by some undertakings to derive commercial premiums which deviate strongly from the technical price because the AI measures whether the policyholder will accept such price. Such approaches might lead to greater differences in premiums not related to risk factors, having detrimental impact on the most vulnerable consumers.[16]

2.43. Artificial Intelligence is also being used to construct chatbots and thus to enhance sales and distributions. Chatbots can aid policyholders to choose the desired product or can serve as an instrument to be used by a broker. In practice, chatbots have been used to aid for pension and capital planning services in Life insurance as well as to provide customer services. For instance, in case of a car accident a chatbot can provide assistance to the policyholder or serve as an aid on a digital platform, but can also be very disturbing for someone in a vulnerable situation that just had an accident and would prefer to talk to a human. Considering their nature chatbots can provide new services and improve customer satisfaction. It may also lead to consumer dissatisfaction if used in processes where consumers value human interaction over efficiency.

2.44. New types of generative AI are being created. These are often based on so-called Language Learning Models which use existing text documents and generate new text. Insurance undertakings are starting to reflect on the possibility of creating new services. The undertakings can enhance Generative AI with an insurance-specific add-in to develop for instance an advanced chatbot. This would aid certain consumer-facing services such as sales and distribution, claims management, assistance etc. These new technologies could in a first instance aid existing professionals and in a second stage even replace humans e.g. for less complex claims. This would result possibly in operational efficiency, but it could potentially lead to underwriting or

16 On this topic please see EIOPA Supervisory Statement on differential pricing practices in non-life insurance lines of business https://www.eiopa.europa.eu/publications/supervisory-statement-differential-pricing-practices-non-life-insurance-lines-business_en

operational risks if the chatbot does not correctly reflect the undertakings claims. It could also lead to reputational risks if the chatbot shows so-called 'hallucination' and gives misinformation to the consumer. AI (such as a chatbot) could also potentially have a fraud risk if sufficient safeguards are not put in place to e.g. have a correct claims estimation.

2.45. In the analysis of the business models supervisors are recommended to consider whether the insurer is using AI and if so the areas and level of its use.[17]

Distributed Ledger Technology

2.46. Distributed Ledger Technology is a means of recording information through a register hosted by a blockchain. These technologies enable participants (nodes) in a network to propose, validate and record state changes (or updates) consistently across the network's nodes – without needing to rely on a central trusted third-party to obtain reliable data.[18]

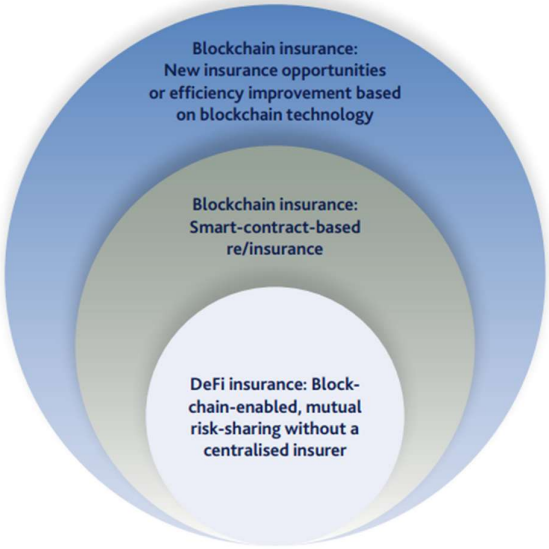
2.47. A common usage of DLT is as an audit trail: any activity that uses the blockchain is recorded, accessible, and approved by the participants of the network. An undertaking can make use of this to optimise its back-end and facilitate further automation leading to cost reduction.

2.48. The decentralised nature of blockchain enables the development of new products and services – such as facilitating the uptake of insurance platforms and ecosystems, improving interaction with third-parties and allowing for smart contracts. Furthermore, crypto assets also often make use of DLT technology.

[17] On this topic als relevant EIOPA Report on AI governance principles https://www.eiopa.europa.eu/document/download/30f4502b-3fe9-4fad-b2a3-aa66ea41e863_en?filename=Artificial%20intelligence%20governance%20principles.pdf

[18] EIOPA, Discussion paper on Blockchain and Smart Contracts in Insurance

Figure 8: Defi/Blockchain in insurance



Source: The Geneva Association

2.49. DeFi insurance refers to a blockchain-enabled, mutual risk-sharing arrangement without a centralised financial intermediary, for example peer-to-peer insurance using tokens for premium and claims payments and operating on a public blockchain – so-called tokenised or token-based insurance. This narrow concept of DeFi insurance is also known as decentralised insurance. It allows users to transact directly with each other on the blockchain, in theory eliminating the need for an intermediary third party. Such peer-to-peer DeFi insurance is not linked to any incumbent insurance undertaking and serves a group of policyholders with similar insurance needs.

2.50. Instead of case-by-case claim approval through traditional underwriting, claims can be processed automatically when appropriate conditions are met due to the decentralised nature of Blockchain. However, in some cases, Peer-to-Peer insurers are not recognised as insurance undertakings (but e.g. as payment institutions) when the claims payments are not linked to a risk for the policyholder. The Joint Opinion of the Joint ESA committee recommended to the European Commission to clarify the legislation for Peer-to-Peer insurers.

2.51. Blockchain insurance includes insurance products that use smart contracts and/or other blockchain techniques as the means to deliver conventional insurance services, for example parametric cover and health insurance. Smart contracts are deterministic computer programs that are deployed and possibly executed on a blockchain and that can carry out the terms of an agreement between parties without the need for human coordination or intervention.

2.52. A concept that is increasing is parametric insurance, a type of insurance that does not indemnify the pure loss, but ex ante agrees to make a lump sum payment upon the occurrence of a triggering, objective and predefined event (e.g. the delay of an airflight). In some jurisdictions however, a provider of parametric insurance is not considered an insurance undertaking since it

does not necessarily cover a loss. The Joint ESAs advice on Digital Finance recommended to the European Commission that this element should be addressed.

2.53. Blockchain insurance also includes insurance activities that use blockchain techniques to improve operational efficiency and/or to develop new business opportunities. Blockchain technology can be applied to any part of the insurance value chain; for example, to improve internal information sharing and to verify identities and claims. Decentralised, country-level pension databases may improve information sharing as well as data security. Blockchain technology can also facilitate supply chain finance and its associated credit insurance, and be used to explore crypto-related risk coverage and new types of services such as financing brokerage receivables.

2.54. The blockchain could hold large amounts of data. Insurers may also run the risk that sensitive data is used indirectly in areas that are not permissible by law leading to data protection issues.

2.55. With the use of multiple ledgers and nodes, DLT also creates additional points of entry for potential malicious acts. This could lead to enhanced cyber risks.

2.56. Moreover, the use of DLT solutions (e.g. for financial transfers (crypto assets) or when they preserve anonymity) could also heighten the money laundering/terrorism financing risks that insures could be exposed to.

2.57. Lastly, crypto assets is defined by Markets in Crypto Assets (MiCA) Regulation as a digital representation of value or rights, which may be transferred and stored electronically, using distributed ledger technology or similar technology. In some cases, no underlying value is present and in other cases, the value is pegged to (a basket of) currencies or other financial instruments. Some insurance companies allow for premium payments in crypto or insure theft of crypto assets. In general, crypto assets are still nascent in the insurance industry.[19]

2.58. The aforementioned technologies might result in possible financial or underwriting risks if the insurance undertaking invests in crypto assets for its own purposes or in the case of unit-linked funds. However, this topic will not be covered under business model analysis but rather in a future review of the Chapter on Prudent Person Principle.

2.59. Currently, issuance of crypto assets as a financial instrument is regulated by MiCA. However, the prudential treatment of crypto assets as an investment or for insurance products is to be clarified under Solvency II.

Big Data

2.60. The diversification of data sources and the increased volume of information, boosted by digitisation, is already a reality for companies. Examples are proprietary digital data, online activity data, and bank account / credit or payment card data.

2.61. Considering the fact that insurance undertakings traditionally deal with personal data (e.g. to determine customers' demands and needs, to fulfil their legal obligations (AML, Taxation, etc.)), any insurance business process including collection and processing of personal data has to be

[19] EIOPA, Discussion Note – Monitoring crypto assets developments in insurance

constructed in accordance to privacy rules that are implemented through Data management systems.

2.62. Data management system relates to both personal and business data and can be self-standing or part of a wider framework that includes IT governance. Nevertheless, dealing with personal data has to ensure privacy by default (embedding privacy rules in the process core, e.g. not being able to collect more data than necessary) and by design (setting up a process so privacy rules will be adhered to (e.g. limiting data sharing only to employees that need it for the purpose of exact business task)). If personal data that is needed to conclude or fulfil the insurance contact is collected through various sources (e.g. different means as gadgets, customer input, public sources) or through various data controllers (e.g. in case of joint controllers) and if that data is later on processed by additional data processors (processing data on behalf of the insurance undertaking), all data origins, sharing points, transfers and included entities have to fulfil privacy prerequisites that ensure the data is not processed and shared without a purpose. A key element in such a case is customer awareness of which data is to be collected, of what are the grounds and reasons for their collection, of data transfers, of the period that data will be kept, etc. This transparency is achieved through Privacy notices that have to be shared at the moment of data collection (if personal data relating to customer is collected from the customer) or during the first communication with the customer (if personal data relating to customer is collected from sources other than the customer).

2.63. A data management system[20] must include technical and organisational measures to ensure data security, including protection against unauthorised or unlawful processing and against accidental loss, destruction or damage. Overall robustness of the system should be achieved to ensure resilience. If data management systems are not set up in accordance with the privacy rules, the results could lead to fines, loss of business and customer detriment. These risks have to be identified in the overall risk matrix and managed properly.

2.64. Digitalisation of a business model implies certain risks such as unauthorised data access that can be observed in various cases (e.g. loss of the device, sending information to the wrong recipient, data breach from the processor side, etc.) that have to be predicted and dealt with. Inadequate technical and organisational measures resulting in customer detriment influences the brand awareness and can lead to serious business losses. Management commitment to privacy risk can be concluded through the way the Data management system is set up, through allocated resources, communication, employee education, awareness rising initiatives, failure analysis and improvement plans.

Robotic Process Automation

2.65. When analysing Digital business models, it is important to consider what parts of the value chain may be automated and how they reflect specific business processes and consumer preferences. Automation is transforming the insurance industry by enabling insurers to streamline processes, reduce costs, and enhance customer experience. For example, the undertaking might have an automated history driven underwriting automation, claims automation, data entry automation, AML and fraud automation, etc.

[20] The governance of advanced analytical tools or artificial intelligence is addressed in Paragraphs 2.20 and 2.38.

2.66. When considering claims processing, insurers are using automation to streamline the claims process by automating tasks such as data entry, document processing, and fraud detection. This helps to reduce errors and processing times, leading to faster claims settlement and increased customer satisfaction.

2.67. Automation is also being used to automate routine policy administration tasks, such as renewals and cancellations, and to manage policyholder data. This can help insurers to reduce human errors and improve data accuracy.

2.68. Identification of potential fraudulent claims can be achieved through automation by analysing data patterns and detecting anomalies. Detection of anomalies and outliers can also trigger required AML checks and notifications. This can help insurers to reduce fraud losses, avoid penalisation and maintain customer trust. Some risks identified for the consumers is the change of burden of proof if a potential fraud is detected. The use of automation should be only to identify potential cases, the concrete identification of a case as fraud needs to be assessed by a human considering the impact that such accusation may have on an innocent policyholder.

2.69. An area for consideration is when the undertaking is overusing automation or is using it in high-emotion sensitive tasks as this might not reflect the customer preferences. The decision on which processes are to be automatised should be taken at the level of the AMSB, on the basis of an analysis of the benefits and costs, including impact on consumers. Automated consumer-facing processes cannot be deprived of the possibility of human intervention and will, in most cases, include the right of the customer to request an explanation of the algorithms use, especially if the automated decision results in legal obligations. This will also include the right to request the decision to be made by a human rather than a machine. Automation will thus significantly decrease operational staff expenses but human interaction, be it for supervision, maintenance or at request of customer, will have to be maintained.

2.70. Modern platforms can leverage artificial intelligence, machine learning and other technologies to offer automation support for the above mentioned processes.

Digital platforms and distribution

2.71. A growing use of digital platforms is observed to bridge consumers and providers of insurance products and services. Specifically, four approaches can be observed toward a platform development:

1. In-house development by the insurance undertaking or group;
2. Partnerships among consortia of financial institutions;
3. Partnerships between financial and non-financial institutions, notably technology companies, e.g., FinTechs;
4. Outsourcing to, and reliance on, third-party technology companies.

2.72. Digital platforms may improve the visibility of products and services and consequently related marketing activities. They also facilitate the conclusion of contracts for products and services,

either directly or by 'funnelling' consumers to the relevant website of the product and service provider.[21,22]

2.73. Firstly, comparison platforms enable consumers to compare different products and services provided by different insurers for instance ranked based on the consumer's preferences. They may charge fees to financial institutions in return for displaying products and services or receive commissions upon having facilitated a contractual arrangement between consumers and financial institutions.

2.74. Secondly, insurance undertaking use digital platforms, that are operated by regulated undertakings or intermediaries, which enable third parties to market and distribute insurance products and services to consumers and can also generate fees.

2.75. Thirdly, ecosystem platforms serve as marketplaces for a large number of financial institutions and other undertakings to distribute their products and services to consumers, meaning that insurance products and services are offered as part of a wide range of products and services available on the platform, and may be operated by financial or non-financial institutions. Current ecosystem platforms tend to concentrate on travel, healthcare, housing, and mobility needs but are evolving quickly.

2.76. Digital platforms bring a lot of benefits to insurance companies and consumers such as:

- Search for convenience, on-line solutions to access products and services;
- Broader range of products/services available to wider consumer base, cross-border;
- Interconnectedness with social media;
- Bundling of different products/services;

2.77. Furthermore, they may result in better financial products, possibly at a lower cost for consumers due to increased competition. The combination of digital platforms with other technologies (e.g. AI) might also result in a reduced protection gap and enhanced financial inclusion. As said above they may also lead to increased prices (AI used to apply diferencial pricing) or financial exclusion (for high-risk consumers or consumers not willing to use new technologies).

2.78. Digital platforms also generate certain risks for consumers and undertakings. In certain jurisdictions it is observed that using digital platforms for direct distribution can result in reduced premium income. Insurance companies are cooperating with traditional distribution partners and use digitalisation to facilitate this interaction. In some cases, the digital platform is used to collect and aggregate the policyholder's data which can be used by intermediaries or insurance undertakings to offer a specific product. This more cooperative (vs. a purely competitive) approach in some jurisdictions leads to faster growth in premium income.

2.79. In some cases, the use of digital platforms can result in concentration risks. For instance, Mixed Activity Groups or BigTech have potentially wide consumer base, if they would orient on financial services, this could result in a dominant position of their platform.

[21] EIOPA, Discussion Paper on the (Re)insurance Value Chain and New Business Models arising from Digitalisation

[22] Joint European Supervisory Authority response to the European Commission's February 2021 Call for Advice on digital finance and related issues: regulation and supervision of more fragmented or non-integrated value chains, platforms and bundling of various financial services, and risks of groups combining different activities

2.80. Furthermore, the aggregation of a large amount of consumer data can result in data protection and privacy issues. The data resulting from financial services could e.g. be used by a Mixed Activity Group for its digital services. This would also create level-playing field issues with other players in the market.

2.81. Lastly, the use of digital platforms can lead to enhanced ICT and operational resilience risks. Often the digital platforms are based on a website or possibly make use of certain cloud services. It is therefore a possibility that an outage would occur. The undertaking should put a robust governance in place as well as the necessary internal controls to manage these risks.

2.82. Digital platforms can also create risks for consumer protection which are further addressed in Sub-section 2.5.

Sub-section 2.5 Digital business model analysis

2.83. New technologies can drive innovation for incumbent insurance undertakings and InsurTechs. Undertakings will typically incorporate this impact in their business model. This can be analysed across the "who-what-how-why" plus strategy, i.e. analysing the business model from the perspective of 5 elements (strategy, customer segments which are targeted (who), services offered (what), value added (why) and processes, activities and risks (how)), as used in this Handbook (see Figure 1).

Strategy

2.84. The growing use of information technologies in the insurance industry can improve the products and services offered to customers. At the same time, digitalisation can bring benefits to insurance companies, namely by reducing costs in their operations, improving risk management, increasing productivity through automation of processes, and developing innovative products and services ultimately capturing new customers.

2.85. The assessment of the digital transformation by undertakings is important for their strategy and future vision with regard to digitalisation. Clear, concrete goals should be transposed in the strategy including to what extent necessary adjustments are made to support such change (such as culture, employees, governance).

2.86. As such, digital transformation should be based on a strategic approach. Some tools require continuous development where multiple adjustments are necessary over time to achieve the expected results. Creating a digital infrastructure may involve complex back-end processes and will require informing employees of the changes and educating customers on how to deal with the new interfaces, while also running the risk of losing some clients (depending on the goal of the infrastructure).

2.87. Digitalisation requires increased security (the use of data is the major concern when it comes to digitalising insurance). The use of sensitive data, on premises, in the cloud or on other digital platforms managed by thirty party providers requires special attention from supervisors. Insurance companies will have to ensure the security of their systems.

2.88. The use of outsourcing or other types of partnerships is, as such, an important strategic decision.

2.89. Digitalisation increases the costs associated with the implementation and maintenance of information technologies over time (continuous development) as well as developing staff's technology skills and increasing technological knowledge.

2.90. The use of technological tools that entail high implementation and development costs may be accessible to just a few undertakings.

Cross-border business

2.91. In general, the orientation to new markets is well established within the insurance industry. If an existing insurance undertaking with a high degree of digitalisation aims to expand its business to further markets, it can be handled as a standard case from a supervisory perspective. Special attention might need to be paid to InsurTech business models due to their novelty and to undertakings that want to expand their business without sufficient knowledge of the targeted EU market and those already struggling to generate a meaningful amount of insurance business in their home countries. Furthermore, cross-border expansion of InsurTech companies in their early phase of development bears some additional risks if the undertaking is not fully aware of country-specific legislation.

2.92. The undertakings that intend to extend their business activities to another market within the EEA need a sound understanding of the respective local characteristics in that particular insurance business and of local legislation.

2.93. The host market itself can benefit from the entry of a new market participants. with a functioning digital business model. The roll out of an existing and functioning digital business model can enhance the competition and the development in the host state.

Customers segments which are targeted

Identify the customer segment for which the new technology is implemented. Customer is a broad concept and can be internal (within the undertaking) or external (customers, distribution channel, etc).

2.94. When new technology is used mainly to improve internal processes and reduce costs the focus should be on the internal users. In this sub-section the focus is on the customers.

2.95. In general, it can be observed that incumbents and new market entrants with digital business models adjust traditional insurance products and features to attract specific customer segments such as younger customers.

2.96. Digital customer services can enhance the value proposition of products and services and give additional value for certain customers (i.e., value that goes beyond the value of the actual market offering).

2.97. An undertaking offering digital services should identify its communication strategy and decide how to communicate with its customers. Customers are increasingly characterised as more experienced, more informed and more demanding, often choosing to make comparisons with other insurers, and wanting a simple, safe and consumer-centric journey tailored to their individual needs and preferences.

2.98. Insurance companies that want to remain competitive in the market need to start investing in omnichannel communication (e.g. across multiple channels in function of the customer's needs

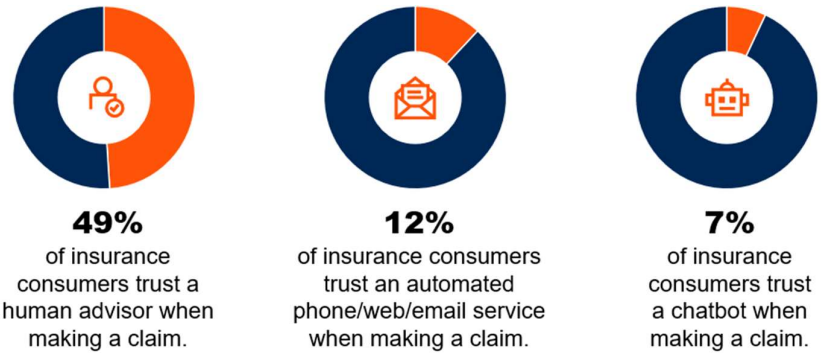
and preferences) and ensure that all channels have support to answer questions and solve problems.

2.99. In terms of aligning and redefining the customer experience, it is essential for insurers to know their customers and to focus on how to retain them and not to focus exclusively on attracting new customers at the underwriting phase.

2.100. Although many customers look for information online, many still use traditional ways of communication and contracting. Thus, emphasis should be on combining models, exploring new channels and technology such as AI, chatbots, digital assistants, natural language processing, so to collect, verify and process customer information but use also traditional ways of communication in sensitive processes such as claims handling.

2.101. From a business model analysis, supervisors are recommended to challenge the undertaking regarding the communication approach to customer and to assess if decisions on which processes are automatised and which ones still require human interaction were taken having in mind the target customers needs and expectations. For example, policyholders/customers may need to discuss personal issues and claims with human staff, as machines and automation lack empathy. There are target groups more prone to automate processes than others, and within the different processes across the value chain there is a different level of automatation. Supervisors are recommended to consider that in addition to the risk inherent to the use of machines/algorithms, depending on the specific situations and the nature of the offered products there might be a risk of using digitalisation in an area requiring an individual personal treatment.

Figure 9: Trust in human/machine advice for claim management



(Source: Guide Insurance Customers to Safety and Well-Being, Accenture's Global Insurance Consumer Study 2021, Accenture)

2.102. Modernising operations and reassessing their processes, regardless of the technologies used, taking care of cybersecurity, creating a robust and agile digital infrastructure and omnichannel communication, are prerequisites for insurers to prosper by adapting to increasingly demanding consumers and to the market tending to be more competitive. The consumer segments specifically targeted seem to include university graduates and young professionals, offering them simply structured products with maximum standardisation and certain risk limitations..

2.103. Incumbent market participants have shown a certain interest in experimenting with the above-mentioned approaches as well and offer tailor-made insurance products for younger customer

groups. The products, for example, contain general liability, household protection and bicycle insurance. In some cases, the incumbent players have founded undertakings within their group structure that specifically focus on those innovative business strategies and labels. In most cases, the label appearances show no direct link to the incumbent undertaking and those labels try to imitate, to a certain degree, a business start-up.

2.104. In some cases, under those labels are insurance intermediaries who act as distributors for the incumbent undertaking.

2.105. It can be observed that innovative products and services with some aspects of digitalisation are (initially) offered to certain customer segments. One example is the innovation of MTPL tariffs that are calculated with respect to the actual style of driving of the insured (telematics). In practice, those tariffs were mainly initially offered to the younger customer segments. Just at a later stage the product (potentially more developed) was rolled out to all customer segments.

2.106. Undertakings with innovative business models also tend to target customer groups with a high online affinity (the digital native generation). This approach has an effect on their distribution channels and advertising. Highly digitalised undertakings tend to prefer intermediaries, which also make use of innovative technologies (like offering mobile applications for the conclusion and management of insurance contracts). Comparison websites also play a significant role, although this online distribution channel cannot be specifically attributed to insurance undertakings with an innovative business model. It has to be noted that the policyholders' online risk profile might be different to the risk profile of customers shopping in physical premises, so this inconsistency, if not considered, can lead to adverse selection and potentially higher claims.

2.107. Supervisors are recommended to have a close look at insurance portfolios accumulated by innovative forms of communication to customers (for example through social media cooperation and advertisement). Such portfolios might have a diverging risk profile compared to the traditional mixed origin ones.

2.108. The same applies for portfolios acquired through comparison websites. Especially newly established companies lack experience with costumer groups and their behaviour, when focussing on certain distribution channels.

2.109. Supervisors are recommended to take these different behaviours into account when assessing business models with the above-mentioned distribution strategies as the business plans might tend to overestimate achievable sales goals and to underestimate aspects like loss distribution, lapse probablity and other key indicators important for the underwriting result. In general, the estimates and assumptions put forward by the undertakings can only be challenged by comparing them to the available market wide statistics (if any available at all). Those might not reflect the effects of focussing on certain distribution channels.

Services which are offered

Describes how the new technology impacts the services offered to the target customer. What are the benefits of the new technology on the customers value.

2.110. New technologies have the biggest impact on the services offered to the target customers where digital channels are used. Digital channels represent one of the most relevant dimensions and

perhaps the most material in the analysis of the state of digital development in which companies find themselves.

2.111. The diversity of digital channels that each entity uses, the services / contents offered in each of them, the level of adherence and use clearly result from the implementation of a digital strategy.

2.112. One of the most offered services by the digital channels relate to the possibility of submitting a complaint, directly contacting the undertaking and the customer area, as well as the possibility of using digital platforms for underwriting insurance.

2.113. The website itself is the channel that made it possible to impact a greater number of clients/consumers. In addition, the email marketing, social networks, the App used and the Business to Business to Consumer (B2B2C) models are other channels for reaching more customers.

2.114. Supervisors are recommended to have a full understanding of the channels used, the services offered and the processes that can be performed digitally, including the penetration of such channels/services in the customers base of the entity. This is relevant to new players to assess for example the growth possibility of the business and for incumbents to understand how they handle the mix of customer types and expectations.

Value Added

Relates to the value added of the new technology to the revenue model. In essence, it points to the elementary question of any undertaking, namely how to make money in the business.

2.115. An incumbent insurance undertaking and an InsurTech will implement new technologies to drive innovation. Ultimately, they aim to generate value for the undertaking and for the consumer by improving productivity and existing revenue, providing a better customer experience, offering new products and services, and creating new business models.

2.116. The new value will be driven by changes across the value chain (see Figure 2: Insurance Value Chain).

2.117. The use of new technologies such as digital platforms can improve the sales and distribution process. If the data of the consumers across insurance products is available on the digital platform, this can also lead to enhanced cross-selling of new insurance products. For the insurance undertaking, this can lead to an increase in premium income.

2.118. For pricing and underwriting, it is observed that the use of e.g. artificial intelligence enables improved risk selection and a price which reflects more appropriately the true risk of the policy. Other technologies such as Internet of Things might allow the use of biometrics and telematics to track the risk of the consumer and to adjust the premium accordingly. This would be expected to lead to an improved profitability and to a decrease in the loss ratio.

2.119. Digital platforms, ecosystems and open insurance increase the possibilities of offering new services to the customers. These are not always direct insurance services, but can also be related to insurance (e.g. offering accident data analytics, or risk management advices in case of cyber underwriting). In some cases, these ancillary services can generate additional fees and diversify the profile of the insurance undertaking. Alternatively, the services may lead to a greater fidelity of the consumer and to a lower lapse rate.

2.120. Other technologies such as robotic process automation or blockchain can in their turn lead to more efficient processes and can optimise the back-end of the insurance undertaking. Also AI can facilitate the processes related to claims management and can lead to an enhanced automation for smaller, less complex claims. Different technologies can therefore lead to lower administrative and other expenses.

2.121. In some cases, insurance undertakings have also started to use Big Data applications to differentiate between investment strategies and assess which asset allocation generates the most favourable investment return thus managing better their investment income.

2.122. Lastly, claims management can also be influenced e.g. by enhanced fraud analytics by making use of Big Data and Artificial Intelligence. Fraud detection is often a very delicate part of claim handling. The analytics can highlight claims which are more sensitive to fraud that ultimately leads to reduced claims costs and reserves and therefore beneficial claims development results.

2.123. The undertaking can generate new value across different parts of the value chain. However, these elements typically are accompanied by financial, underwriting, IT and governance, and conduct risks.

Processes, activities and risks

To build the value proposition, an undertaking has to master several processes, activities and corresponding risks.

2.124. Alongside the benefits, mastering digital processes and activities also leads to increased risks associated with digital transformation in undertakings, such as conduct risks, IT and governance risks, and financial risks.

Conduct risks

2.125. Some of the key conduct risks in digital business models of insurance companies include:

- Data Privacy and Security Risks: Insurance companies collect and store a significant amount of personal data from customers to facilitate underwriting processing and marketing. Some of these data are extremely sensitive such as health related data. This data is vulnerable to cyber-attacks, theft, and misuse. Insurers must implement robust data security and privacy measures to safeguard customer data and comply with relevant regulations.
- Fairness and transparency risks: Digital business models may make it easier for insurers to manipulate prices or unfairly discriminate some customers. Insurers must ensure fairness and transparency in their pricing and underwriting practices, including disclosing the factors that determine premiums, and offering clear explanations based on risks for any pricing discrepancies.
- Distribution Channel Risks: Digital business models may rely heavily on third-party distribution channels such as mobile apps, social media, or comparison websites. Insurers must ensure that these channels adhere to their own policies and regulations and are transparent with customers about the products they offer.
- Product Design Risks: Digital business models may allow insurers to offer new and innovative products that are not well understood by customers. Insurers must ensure that these products are designed with consumer needs in mind and are adequately explained to customers.

- Customer Service Risks: Digital business models may reduce the amount of direct interaction between insurers and customers, potentially leading to poor customer service. Insurers must ensure that their digital platforms are user-friendly and provide clear, adequate and timely communication to customers.
- Clients Information Requirements' Risks: Greater digitisation, especially in the scope of subscription, may lead the consumer not to read all the information, since "just one click" is enough to sign the contract. Thus, in certain information it is necessary to introduce approaches that would ensure a proper information, for example double clicks so that the person is drawn to the matters that are more important (as if it were equivalent to a signature or a declaration that he became aware of certain matters). Besides, it is necessary that the language, typically more informal in the digital context, is still clear, complete, and enlightening.
- Misinformation Risks: The collection of elements about the insurance risk through digital means could lead the insurer to receive incorrect/ incomplete information, which may converge to insurance proposals that are not the most adequate to the customer needs, enhancing mis-selling situations. The same for an inadequate interpretation of the product's characteristics by the customer at digital platforms.
- Risks of defining responsibilities and delayed payments: Some of these aspects are developing so fast that legislators are not able to keep up with these innovations at the same pace, leaving situations without legal coverage.

2.126. To mitigate these risks, insurance companies must establish strong risk management practices that incorporate technology, people, and processes. This includes investing in robust data security and privacy measures, providing adequate training to employees and third-party providers, and regularly monitor and evaluate the performance of digital platforms to ensure compliance with regulations and industry standards.

2.127. Timeout due to session inactivity, encryption of information, strong authentication, alerts via e-mail or SMS and security mechanisms based on biometrics are good examples of measures to be implemented by entities for data protection.

2.128. On the other hand, entities must provide adequate and timely information to customers, namely about potential risks and security procedures in accessing digital channels (e.g. when subscribing to digital channels, through pop-ups/ banners, through the social networks and through newsletters or e-mails sent to customers).

IT and governance risks

2.129. New ways of distribution and products emerging can challenge existing supervisory and regulatory practices. A key challenge seems to be the emergence of platforms and ecosystems, that can significantly disrupt existing manufacturing and distribution. There is also growing involvement of third parties providing new services through outsourcing[23].

2.130. However, those new ways of distribution and emerging products may also create new conduct and prudential risks and amplify or relocate significantly existing risks[24] (e.g., operational risk,

[23] EIOPA, Discussion Paper on (Re)insurance Value Chain and New Business Models arising from Digitalisation
[24] EIOPA, Guidelines on information and communication technology security and governance.pdf

Information and Communication Technology - ICT risks, security, governance, and reputational risks). It can also lead to legal and compliance issues (e.g., data protection and compliance with outsourcing rules). The widespread use of third-party providers can also lead to concentration risk if a large number of undertakings become dependent on a small number of dominant third-party service providers. Other possible sources for new risks include e.g., cloud outsourcing, partnerships with ICT third parties, value chain fragmentation, new players etc. Considering these risks in some situations NSAs are recommended to inform other regulatory authorities, (e.g. data privacy authority, competition etc.)

2.131. An increasing concentration is observed for certain basic services, such as cloud computing which is primarily outsourced to large third-party providers with complex Service Level Agreements in place.

2.132. In this context, a possible fragmentation of the insurance value chain could occur and as such might lead to supervisory and regulatory challenges. Consequently, supervisors are recommended to pay more attention to different companies involved throughout the value chain. Some of those entities will be regulated undertakings such as intermediaries or other insurance undertakings or, in the case of service providers, they should be identified. In the future, DORA will ensure oversight of the critical third party providers.

2.133. Another risk to be considered is the legacy system risk. While in general insurers are aware of the need for digital transformation, many are reluctant to go ahead because of the cost and complexity of replacing their software and IT systems. Most core systems have been developed and deployed years or even decades ago. Throughout the years they have been updated to reflect the changing needs that makes them compliant and reliable but also expensive to manage or change. The reluctance to replace their core systems might affect the insurance undertaking's level of digitalisation and the sustainability of the business model moving forward.

2.134. In the past decade, insurers increasingly opted for standard off-the-shelf core systems that promise relief from maintaining and developing custom-built legacy systems. However, these systems could pose another trap – reducing insurers' self-sufficiency and independence. Relying on the vendor for every little change is the recipe for reduced agility and flexibility. Core system outsourcing agreements must ensure the transferability of the system maintenance and development services in case of cancelation so to ensure sustainability. Risks of potential necessity to switch providers or a potential lock-in must be addressed through risk assessments prior to outsourcing.

Financial risks

2.135. New market entrants tend to be too optimistic about the growth of their business and the low level of their operational costs, i.e. the realistically achievable premium income and cost structure. While premium income is low at the beginning, the newly established companies at the same time need to invest a lot, especially in IT and in setting up distribution venues. If growth/cost expectations, laid down in the business plan, do not materialise at all or within the estimated time frame, the new undertakings might run out of sufficient capital before the break even (i.e. profitability) is reached. The consumption of own funds might lead to breaches of SCR and MCR requirements.

2.136. At least in such scenarios, where the own funds fall short from a regulatory capital requirements perspective, supervisors are recommended to conclude that a specific business model is not sustainable. To avoid such scenarios, the undertakings themselves try to attract further financing during the early stages of the development to cover expenses and buy further time to develop the business.

2.137. From a supervisory perspective, this reliance on reiterated financing rounds bears some risks and it is not necessarily compatible with the length of the insurance business which can be long-term e.g. in case of life insurance. In case of a claim, the beneficiary has to rely on the ability of the undertaking to settle the claim, even for a prolonged period. A breach of the capital requirements or even an insolvency pose a huge risk for the beneficiary as the smooth processing of the claim in due time (and in some cases even a full compensation) might be in jeopardy. For this reason (amongst others) supervisors are recommended to emphasise the importance of sufficient capitalisation at an early stage and monitor the implementation of business plans.

2.138.

2.139. Supervisors are recommended to pay special attention to such business plans and are recommended to scrutinise the underlying assumptions. New undertakings should secure sufficient seed capital from day one so that they are able to survive a significant period without generating enough revenue to compensate the expenses. Certain amounts of capital could be clearly set aside that are reserved for financing start-up phase related expenses for IT infrastructure and establishing distribution channels. Setting up a successful and sustainable business model often depends on whether the IT set-up costs, and other expenses are adequately financed in the long term. Business plans that claim that (future) expenses for developing and expanding the business can be financed through retained earnings are highly questionable from a prudential perspective.

2.140. In the start-up phase, it seems especially important to monitor closely not only the premium income and its growth but also the development of the expenses (and as an indicator the number of employees[25]). Where necessary, supervisors are recommended to consider requesting further reporting from the undertaking (e.g. monthly reporting about business performance).

2.141. In some cases, it was observed that new InsurTech players did not have the necessary underwriting experience which could result in higher insurance claims.. This risk can be amplified in case of cross-border business.

[25] Depends on whether such data is available in the national supervisory reporting of insurance undertakings.

SECTION 3: QUANTITATIVE AND QUALITATIVE TOOLS TO SUPPORT BMA, INCLUDING PROPORTIONATE APPROACHES AND TOOLS

3.1 In the business model analysis supervisors gather understanding of the undertaking's business model, its forward-looking projections and expectations and form a view whether the business model is viable and sustainable.

3.2 To aid the NSAs in the establishment of a Business Model Analysis, different tools can be used. This section provides an overview of some of them that can be used in the different steps of the BMA including tools that address the specificities of the digital business models.

3.3 In addition, this section also provides two macro tools that will allow the NSA to:

- gain insight on the level of digitalisation of the undertaking and on the significance of the digital business model (digitalisation score);
- assess viability and sustainability of the business model in the short and longer term (viability and sustainability score).

3.4 The two macro tools can be used either independently or complementary to the other qualitative and quantitative tools. If used in a complementary way, some of the requested information for the 10-step framework might not be needed as it is already included in the tools. In such cases the steps or the information to be skipped will be explicitly indicated.

3.5 To gather a full view of the level of digitalisation and the viability of the business model supervisors might follow each of the different steps. If, instead, the aim is to have a targeted (although less detailed) analysis, then the focus might be only on the digitalisation score and the viability and sustainability score (see Sub-section 3.2) which comprise different tools of the step-wise analysis. The scores will partially reuse certain elements of the different steps. However, supervisors can amend the set-up of the steps and the scores if they have national specificities which require this.

3.6 The quantitative and qualitative information used is particularly useful for supervisors to understand the insurer's strategy, its own forecasts, the underlying assumptions, and their plausibility. It may also provide insights about opportunities, as well as threats and vulnerabilities, that insurers believe they may face in the foreseeable future as well as to give idea of the insurer's perception of its strengths and weaknesses compared to its peers.

3.7 Some of the information that can be used includes but is not limited to:

a) NSAs macro-analysis and analysis of external environment (fragmentation of the value chain, developments in the sector, changes in law or fiscal policy, macro-economic developments such as interest, ageing, climate, cyber);

b) Undertaking's management information and business plans from the current year and forward-looking forecasts with underlying economic assumptions. Business plans are particularly key as they will often be the NSAs' only source of forward-looking data;

c) Undertaking's financial information (P&L, balance sheet, other financial reports), key areas of financial performance, main drivers, and key metrics;

d) Regulatory reporting including ORSA (may provide useful information about undertaking's medium-term financial position and the forward-looking analysis on the impact of digitalisation risks). Undertaking's reverse stress testing results, if performed under the ORSA;

e) Undertaking's disclosure information (including SFCR or sustainability specific information);

f) Third party reports and presentations (e.g. equity/credit analyst, investors, auditors, rating agencies) with a caution to ensure any third party has sufficient expertise to place reliance on;

g) Dialogues with insurer's board members, senior management, key functions, internal and external auditors etc;

h) On-site findings.

i) Digitalisation score which assesses the extent to which the undertaking's business model is digital;

j) Viability and sustainability score which indicates whether the business model is viable and sustainable considering the risk mitigation actions taken by the undertaking.

3.8 The most complex tools including stress tests, profitability forecasts and scenario analyses are generally used for the larger and more systemically important entities and groups. Some tools, such as level of digitalisation assessments and peer group comparisons, are used to identify outliers. Stress tests based on multiple scenarios and sensitivity tests are used to assess how sensitive are the insurer's profits to changes in external factors, such as changes in interest rates and/or in funding costs.

3.9 The level of detailed analysis work during the BMA exercise should be commensurate with the nature, scale, and complexity of the risks the undertaking faces or could face and the impact it could have on policyholders. The assessment can be performed either at group or at solo level depending on the NSA's judgement.

SUB-SECTION 3.1: KEY TOOLS USED IN THE DIFFERENT STEPS OF THE BUSINESS MODEL ANALYSIS

3.10 This section provides further details on the use of quantitative and qualitative tools in the different steps of the business model analysis considering that some tools might be used in more than one step.

3.11 For the Quantitative and qualitative analysis of the current business model, business model viability evaluation and strategy sustainability evaluation the following sources of information can be used:

- Supervisory reporting including the ORSA Report (e.g. of the undertaking's reverse stress testing results);

- Third party reports and presentations (e.g. equity/credit analyst, investors, auditors, rating agencies) with a caution to ensure any third party has sufficient expertise to place reliance on;
- Dialogues with insurer's board members, senior management, key functions, internal and external auditors etc;
- Undertaking's public disclosure information;
- On-site findings.
- Market monitoring exercises (e.g. EIOPA Digitalisation Market Monitoring Survey[26])

1. Preliminary assessment

3.12 This step is used to assess which undertakings are to be included in the BMA analysis and which activities, products and business are to be analysed.

3.13 To define the undertakings with the highest business model risk NSAs could use the QRT data.

3.14 Additional information that the NSAs might consider when identifying the undertakings is the outcome of any thematic reviews – e.g. a sector-wide analysis may reveal common underlying issues that prompt additional undertaking-specific analysis and/or an outcome of any previous supervisory findings. Market changes – e.g. significant market entry/exits or market structural features or/and time since previous assessment are other factors to be considered. Based on the above business model criteria and the other priorities in the Supervisory Review Process, the NSA can decide on the undertakings to be included in the BMA analysis scope.

2. Identification of relevant areas

3.15 Once the undertaking(s) has been selected as a next step the supervisors will need to identify the areas of analysis. For this purpose, they can use any of the tools under Sub-section 3.1, together with the outcome of the digitalisation assessment (see Sub-section 3.2.1).

3.16 When deciding on the scope and the relevant areas of the BMA, NSAs can consider the output of the preliminary assessment. The following elements should be considered:

a) corporate structure of the undertaking including identification of subsidiaries, branches etc.;

b) main business activities, geographies where the undertaking operates. For some (digital) models freedom of services activities may be relevant as well;

c) relevant metrics;

d) impact assessment of the undertaking (significance of the undertaking or digitalisation level) considering innovative technologies adopted or planned as well as IT outsourcing or partnership agreements;

e) previous supervisory findings;

[26] Further information on EIOPA Digitalisation Market Monitoring Survey can be found here https://www.eiopa.europa.eu/eiopa-launches-new-survey-map-financial-innovation-insurance-2023-03-06_en

f) strategically important business areas;

g) outcome of thematic reviews;

h) observed changes in the business model without the undertaking declaring them or releasing new strategic plans;

i) peer comparisons – exceptional performance of a business line when compared to peers (being an outlier) may warrant attention;

j) market changes.

k) time since previous assessment.

3. Analysis of the business environment

3.17 This step includes an analysis of the business environment in which the undertaking operates considering any external and internal dependencies.

3.18 In the analysis of the external dependencies the areas to be considered include, for example:

a) Geopolitical situation and macroeconomic development including forecasts;

b) Technological developments;

c) Overall customer behaviour trends;

d) Cross-sectoral interconnections;

e) ICT-(sub)-third-party providers;

f) Trends regarding ICT- and cybersecurity-risks;

g) Digital competitors – general trends and new players;

h) Distribution channels - intermediaries and partnerships;

i) Specific regulatory drivers (legislation, licences required, changes in fiscal policies, changes in accounting rules, AI Act, FIDA, etc.);

j) Rating agencies;

k) Available resources;

l) Overall market trends.

3.19 Regarding the analysis of the internal dependencies and undertaking-specific digital business drivers, the following areas could be taken into consideration:

a) Business culture & staff attitude to digital innovations;[27]

b) Governance set-up, current policies, processes and procedures ;

c) Stakeholder support;

d) Available capital (sources);

[27] The business culture can be assessed by means of expert judgement of the supervisor based on regular activities, the output of inspections and the policy and governance established by the underaking.

e) Adaptability of IT assets;

f) Quality and level of investment into IT systems/platforms;

g) Staff capacity and knowledge structure;

h) Effectiveness of distribution channels;

i) Risk management capabilities;

j) Brand direction;

k) Competitive advantages.

4. Quantitative analysis of the current business model

3.20 Useful information for this step in addition to the one listed in 3.11 may be found inundertaking's and sector financial information (P&L, balance sheet, other financial reports), key areas of financial performance, main drivers, and key metrics.

3.21 Moreover, questions and tools for the quantitative analysis are integrated in:

- the digitalisation scoring process (Investments in digital technologies section of the *Strategy* building block and last question of the *Technologies* building block, see Sub-section 3.2.1).

- the viability and sustainability scoring process (quantitative profitability metrics in the *Financial and value chain impact* building block, number of complaints in the *Conduct impact* building block, statistics regarding digital platforms and ecosystems in the *Technologies* section, see Sub-section 3.2.2).

5. Qualitative analysis of the current business model

3.22 Useful information for this step in addition to the ones in 3.11 may be found in:

- Dialogues with insurer's board members, senior management, key functions, internal and external auditors etc;

- Digitalisation score, which indicates to what extent the undertaking's business model is digital. Should the NSA choose not to use this tool, they could still leverage most of the questions asked in the scoring process (see Sub-section 3.2.1).

3.23 Moreover, answering the most descriptive questions put forward in the various building blocks for the Viability and Sustainability scoring process may help gain an overview of the current business model (see Sub-section 3.2.2).

6. Analysis of strategy and business plans

3.24 NSAs are recommended to undertake an analysis of the insurer's business strategy and financial projections (analysis of key components for delivering the strategy, main dependencies, and constraints) for the purpose of understanding its assumptions, plausibility and riskiness. The analysis should cover both quantitative and qualitative aspects. Parts of the analysis of the strategy can be conducted concurrently with the quantitative and qualitative analysis of the

business model. For example, products can be analysed from a historical, current, and forward-looking basis.

3.25 Frameworks that can be adopted to understand more fully the appropriateness of the undertaking's strategy include but are not limited to: Porter's 5 Forces[28], generic service/cost leader strategies, value chains, the BCG/market attractiveness matrices[29] as well as any analysis presented by the undertaking.

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3.26 Additional tool to be considered in this step is the use of the viability and sustainability score (see Sub-section 3.2.2).

7. Business model viability evaluation

3.27 In this step of the Business model analysis NSAs are recommended to undertake a quantitative and qualitative forward-looking analysis of the financial projections answering the question whether undertaking will be able to generate sufficient and stable return over the short to medium term[30].

3.28 NSA could perform a quantitative analysis of the last 3 years to assess how the relevant indicators behaved in the past by looking at the volatility and trends of these indicators. Considering the changes in the indicators from the past the supervisors can form a view whether an undertaking will be generating sufficient and stable return in the short to medium term.

3.29 With start-ups (Insurtech) and undertakings with big investments in new technologies the relevance of the behaviour of the indicators in the past are less relevant in answering the question whether an undertaking will be able to generate sufficient return in the short to medium term. Confronting past forecasts numbers with realised outcomes could give a good indication of the quality of projections.

3.30 Useful information for this step may be found in 3.11.

3.31 Viability and sustainability score, which indicates whether the digital business model is viable and sustainable considering the risk mitigation actions taken by the undertaking. It thus allows assessing the residual risk associated to the undertaking's business model. Should the NSA choose not to use this tool, they could still leverage the remaining questions of this scoring process (see Sub-section 3.2.2).

[28] Framework for industry analysis and business strategy development. Porter's five forces include - three forces from 'horizontal' competition: the threat of substitute products or services, the threat of established rivals, and the threat of new entrants; and two forces from 'vertical' competition: the bargaining power of suppliers and the bargaining power of customers.

[29] Chart that was created to help corporations to analyse their business units. This helps the undertaking allocate resources and is used as an analytical tool in brand marketing, product management, strategic management, and portfolio analysis.

[30] How short, medium and long term are defined will depend on the business model of the insurance undertaking and can differ e.g. between Life and Non-Life insurance.

8. Strategy sustainability evaluation

3.32 During this step the NSAs are recommended to assess the undertaking's ability to generate sufficient returns over a longer period. An additional consideration when assessing the sustainability of a model is the adequacy of the resources planned for the implementation of the strategy.

3.33 Assessing sustainability also means reviewing the growth strategy.

3.34 Useful information for this step may be found in the sources mentioned in 3.11.

3.35 Viability and sustainability score, which indicates whether the digital business model is viable and sustainable considering the risk mitigation actions taken by the undertaking. It thus allows assessing the residual risk associated to the undertaking's business model. Should the NSA choose not to use this tool, they could still leverage the remaining questions of this scoring process (see Sub-section 3.2.2).

9. Identification of vulnerabilities

3.36 The NSA is recommended to identify vulnerabilities for the undertakings in scope of the BMA analysis. The outcome of the Business model viability evaluation allows to identify vulnerabilities in the short term (step 7). The strategy sustainability evaluation permits to identify them in the long term (step 8). The NSA should account for the inherent business model risk considering the mitigating actions that the undertakings put in place to mitigate certain vulnerabilities. Residual business model risks might still exist if the mitigating actions are not complete or sufficient to address all elements.

3.37

3.38 The NSA is recommended to develop a priority ranking of the initial and residual vulnerabilities which can be used for risk-based supervision of the undertaking going forward.

10. Summary of the results and scoring

3.39 This final step in the analysis of the business model includes an overall assessment of the results and scoring. It outlines the outcome of the business model analysis and the supervisory judgement on its plausibility.

3.40 Considering the analysis performed in the previous steps supervisors can identify whether the business model is risky or successful.

3.41 Some common success indicators for an insurance (digital) business model might include:

- Increased efficiency and productivity, as measured by metrics such as reduced processing time for claims and underwriting, streamlined processes, and reduced operating costs;

- Improved customer satisfaction and engagement, as measured by metrics such as increased customer retention, higher customer satisfaction scores, and increased adoption of digital channels for purchasing and managing insurance policies;

- Enhanced risk management and underwriting capabilities, as measured by metrics such as improved risk assessment, lower loss ratios, and increased profitability;

- Increased market share and revenue growth;
- Enhanced brand reputation and customer trust, as measured by metrics such as increased positive brand sentiment, higher customer satisfaction.

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