



Digitalisation in the Austrian Financial Market

Status Quo, Outlook and Call for Input

June 2019

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INTRODUCTION AND NOTES

What is the purpose of this report?

Digitalisation of financial services is responsible for the framework of the financial market changing more quickly and radically than has been the case in decades. It is generally clear and no longer a revelation that digitalisation provides undertakings in the financial market with many opportunities, while also exposing them to new threats. Logically the Austrian Financial Market Authority is placing digitalisation under scrutiny in light of new challenges it throws up and the supervisory tools the FMA has at its disposal.

The FMA wishes to take an additional step forward and gain even more new insights. In 2018, a comprehensive analysis on digitalisation in the Austrian financial market was therefore started. This study serves as a preliminary stock take, which specifically depicts the current status of digitalisation of the Austrian financial market and areas in which digital technologies are deployed. Furthermore, we also want provide an assessment in a concise form about drivers, trends and potential future developments. By doing so, we hope to create a sound basis for us, the FMA, to remain on the ball with regard to digitalisation, and to be able to correctly assess developments.

Risks represent the FMA's focus of attention in so doing. We are therefore examining digitalisation in the Austrian financial market predominantly from a risk-based perspective. In so doing we adhere strictly to the principle of technological neutrality: the FMA does not supervise any technologies, but instead primarily focuses on risks. Equal risks require equally high supervisory requirements, irrespective of whether they arise from digital or analogue business models or processes. Our survey and report assist us in assessing the risks associated with digitalisation in a correct and timely manner.

The best basis for information about digitalisation in the Austrian financial market

We conducted a comprehensive data collection exercise in the Austrian financial market as a basis for this study, in order to obtain new insights into opportunities, trends and risks associated with digitalisation. In 2018 we surveyed supervised entities and were able to base our evaluation on responses received from undertakings across all market sectors. In many sectors of the financial market, we were also able to achieve near 100% market coverage:

<i>Sector participants</i>	<i>Market coverage</i>
■ <i>Insurance undertakings (IUs)</i>	100% (all IUs covered under Solvency II)
■ <i>Pensionskassen (PKs)</i>	100% (all Austrian PKs)
■ <i>Occupational provision funds (OPFs)</i>	92% of the market ¹
■ <i>Credit institutions (CIs)</i>	40 CIs of which 7 SIs
■ <i>Investment service providers and firms (IFs)</i>	80% of the market ¹
■ <i>Management companies (MCs)</i>	99% of the market ²
■ <i>Market infrastructures (MIs)</i>	100% (all Austrian MIs)

We believe that this very high market coverage has allowed the most comprehensive and most detailed study currently available, using the best basis of data and information, on the topic of digitalisation in the Austrian financial market.

¹ Coverage on the basis of revenues (IFs) or the total assets of the Investment Groups (OPFs).

² In the interests of simpler readability the term "management companies" (MCs) is used instead of investment companies (KAGs), real estate investment companies (ImmoKAGs) and alternative investment fund managers (AIFMs) (Coverage calculation excludes registered AIFMs based on fund assets).

CALL FOR INPUT

This study is not however the conclusion of our comprehensive analysis of the digitalisation of the Austrian financial market.

We would like to use it as a basis for launching a broader discussion and intensifying dialogue within the Austrian financial market about the implications of digitalisation in financial services. Your input is therefore particularly important.

We therefore invite you as our stakeholders - supervised entities, investors, savers, insurance policyholders, consumers, public sector institutions and the interested public - to critically scrutinise the findings and conclusions of this study, and to enrich your perspectives, experiences and solution approaches. Several questions have been formulated at the end of every chapter in this report to serve as guidance.

Input about the report may be sent informally by e-mail to digitalisierung@fma.gv.at. The closing date for submissions is 10 October 2019.

REPORT STRUCTURE

The report is broken down into the following parts:

- The **strategies** of the supervised entities in relation to digitalisation (*Chapter I*),
- **new business models:** new players, new interdependencies, new ecosystems, new digitalisation-driven products and the deployment of digital technologies in individual business processes (*Chapters II to VI*),
- **new risks:** changes in IT infrastructure and cyber risks (*Chapters VII and VIII*).
- **new digital technologies:** the functioning of technologies used in the financial market, their associated opportunities and threats as well as practical examples (*Annex*),

Based on research findings about international, European and national initiatives about digitalisation in the financial market and the results of the surveys conducted in individual sectors and based on other observations from ongoing supervision potential implications of digitalisation have been identified in the individual sectors for the FMA's supervisory activities, and potential courses of action for the FMA derived accordingly.

I. STRATEGIES

The financial sector has been in a state of change for many years due to increasing digitalisation. In addition to increased efficiency and cost savings, the purpose of digitalisation is also to quickly recognise the needs and preferences of potential customers and to more adequately satisfy such needs. Demands to constantly adapt and focus business strategy are constantly increasing. Where strategic adaptations are not made in a timely manner, dangers exist that new innovative competitors will drive established players out of the market.

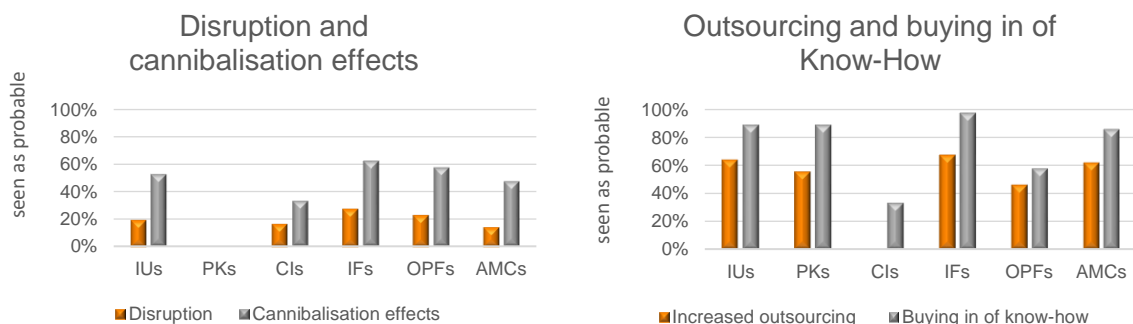
A. Expected Future Scenarios

A general differentiation in expectations exists between evolution and disruption:

- **Evolution:** further evolutionary development assumes that business models exist. Processes used to date and customer interfaces are digitally adapted throughout the value-creation chain.
- **Disruption:** applications are considered disruptive where completely new business models are developed. An accompanying effect may be the creation of new steps in the value-creation chain and redundant steps being removed³.

The undertakings in the Austrian financial market assume in the medium-term that evolutionary development will occur without any disruption as a consequence of digitalisation.

The possibility that there will be disruptive changes within the next three years (i.e. with the basic principle of core business being superseded) is predominantly classed by all sectors in the financial market as being inconceivable. CIs (28%) view disruptive changes as a result of digital developments as being most likely.



Increased usage of external service providers seen as the most probable effect of digitalisation.

- Accordingly, the buying in of external know how (advisory services) is classed in all sectors as being a very probable future scenario in the medium-term (CIs: 98 %, IUs and PKs: both 89%, MCs: 86%, IFs: 58%). Only OPFs view this development as unlikely (OPFs: 67%).

Consequently, the increasing enlisting of help from external partners may lead to supervised entities performing ever fewer services themselves in relation to their financial business. However, buying in know-how and increased outsourcing will generally lead to greater fragmentations of the value-creation chain. The resulting increases in efficiency may however further intensify competitive pressure.

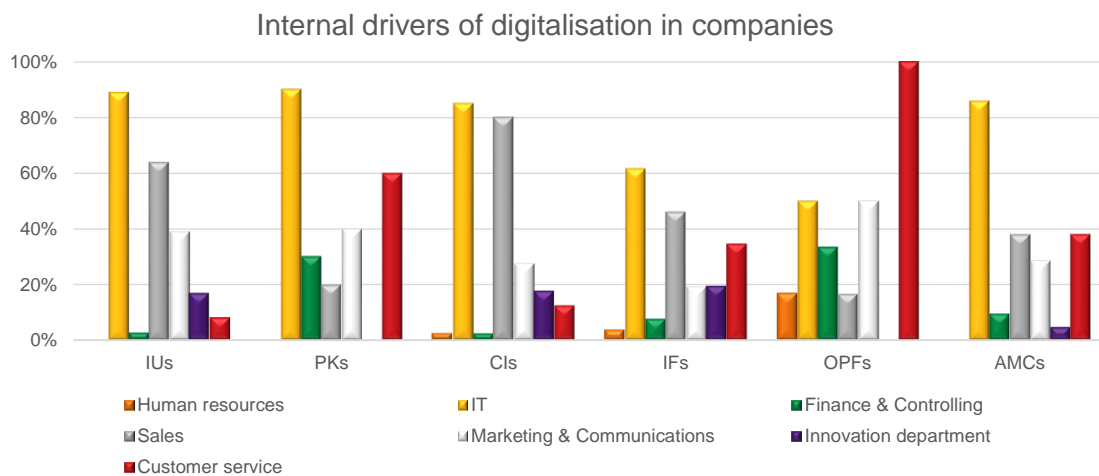
³ Regarding the dimensions, see for example *Gassmann, Frankenberger, Csik: The business model navigator: 55 models that will revolutionise your business* (2014).

B. Drivers of digitalisation

Compared to previous industrial revolutions the current transitional phase is developing at an exponential rather than linear pace.⁴ It also acts as an impulse for the merging of technologies, where the frontiers between the physical, digital and biological worlds are increasingly being broken down.

Continuing development in information technology (IT) is considered to be principle driver of digitalisation in almost all industries.

- In almost all sectors in the Austrian financial market, IT is considered to be the most significant internal driver of digitalisation in companies – in 90% of Pensionskassen (PKs), 89% of insurance undertakings (IUs), 85% respectively in banks (CIs) and asset managers (MCs), 61% in investment service providers (IFs), as well as all three market infrastructures.
- Only among occupational provision funds (OPFs) are digitalisation issues most strongly driven by customer service (100%) – with IT (50%) being the second most significant factor.



- Impulses for further technological innovations therefore originate foremost **from within the company itself**:
 - Irrespective of the apparent role of the management board, the most important impulses originate from IT divisions, where the necessary technical know-how is duly concentrated.
 - Human Resources and Finance & Controlling do not have any discernible influence in regard to the pushing of digitalisation within companies.

Customer wishes generally not the focus of further developments in relation to digitalisation.

- By adapting the company's internal IT to the changing framework, the possibility to take customer requirements into account is increased.
 - It may for example be possible to react more quickly and to create modular offerings and individualised product packages.
 - However, customer wishes are not usually the central tenet of further digital developments, although in some companies sales, marketing and communication, the innovation division or customer service may influence such developments.

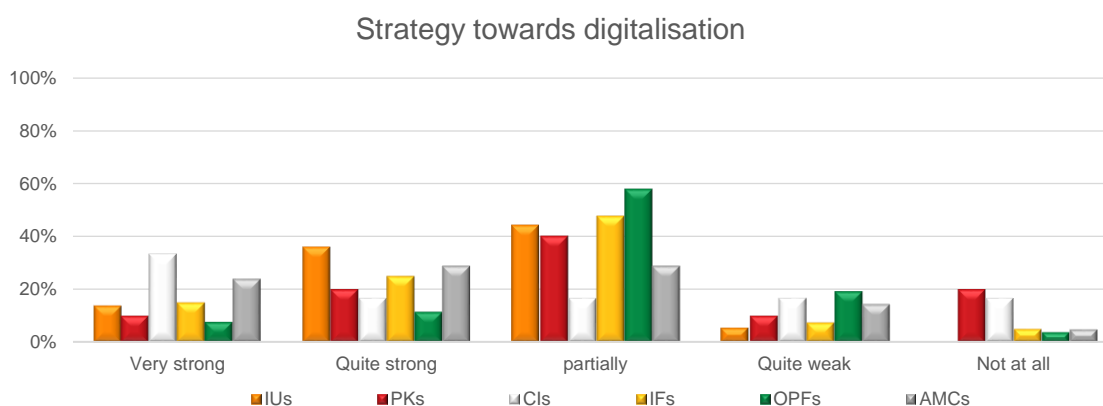
⁴ See for example Schwab, [The fourth industrial revolution – What it means and how to respond](#), Foreign Affairs.

C. Establishing of Strategies

The digital financial market is characterised by new market participants, different and increased customer requirements, more dynamic changes and interlinkages - e.g. due to the Internet of Things (IoT). Technological innovations have penetrated into operative business and must also be taken into account in the business strategy of the supervised entities. The question is whether a separate “**digitalisation strategy**” is required – or better still a “**Strategy for the digitalised world**”.

Overall, the market perceives digitalisation as a highly relevant issue. Many supervised entities are currently in the process of adapting their organisation's strategic focus accordingly. Considered across the various sectors, 15% have even formulated a target vision and a strategy for their digitalisation with measurable targets and budget.

- The companies, depicted in the following graph as having a ‘very strong’ strategy towards digitalisation, cover 33% of OPFs, 24 % of MCs, 15% of CIs, 14% of IUs, 10% of PKs and 8% of IFs.



It is however noticeable, in contrast, that digitalisation is either barely or not reflected at all in the strategy in around 20% of undertakings. This is particularly the case for OPFs and PKs and is attributable to the specificities of their business models.

- The question arises here as to whether entities that have hitherto not paid consideration to digitalisation issues in their strategic focus are well equipped to face the challenges associated with them in the future.

D. Opportunities arising from digitalisation

The digital world presents entities in the financial market with new **opportunities**. Particularly innovative companies are able to generate first mover advantages, where they are able to offer new products and services earlier than the competition. New cooperations, e.g. with FinTechs, may promote the implementation of innovative ideas. Streamlining of processes, increases in productivity and cost reductions are possible in the course of technological innovations. Ultimately new possibilities arise in product design, e.g. as a result of a larger pool of data, and through new possibilities for evaluating and using such information.

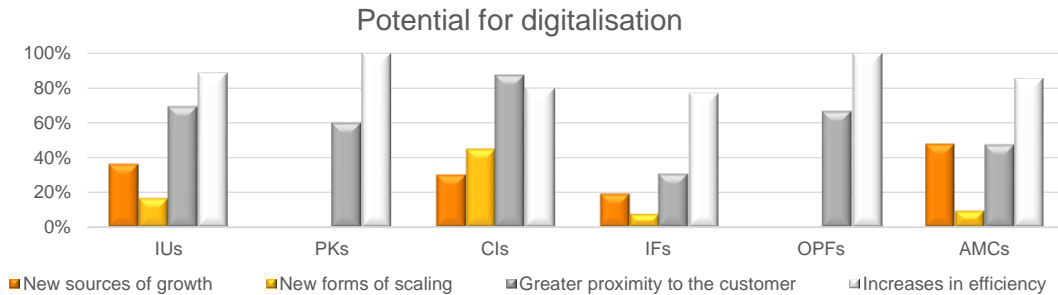
There are however also new **threats** associated with the digital revolution, such as those that provide the insurance sector with new product design opportunities in relation to insurance against cyber risk.

On the whole, new technological opportunities are arising, which allow customer wishes to be addressed in a better and above all quicker manner.

With the exception of banks, all sectors view improved efficiency as the significant potential for digitalisation. Only in the banking sector is a better understanding of customers as a result of more data and points of interactions marginally more important than improved efficiency.

When asked about their motives in relation to further development in digitalisation, Austrian entities see improvements in efficiency as the largest opportunity heralded by digitalisation.

- The entities' internal focus currently also predominantly lies in the potential attached to digitalisation. The range of estimations lies between 100% (PKs) and 77% (IFs).
- Only in the banking sector does the prospect of a better understanding of the customer (88%) exceed the prospect of improvements in efficiency (80%) as a driver.



The expectation tends to exist in all sectors that more new business possibilities will be created as a result of digitalisation than will be lost.

This net “surplus” in terms of new business segments will above all, based on the entities’ estimations, arise from new possibilities in **approaching customers** and as a result of the increased number of **possibilities for using data**. The respective sectors’ expectations remain quite divergent:

- While insurance companies primarily see new business opportunities in particular from IT-based insurance products,
- Pensionskassen are placing emphasis on pan-European pension products (PEPPs) and their distribution via digital channels,
- Banks are focussing on Big Data & Analytics (BDA), and
- Investment firms and asset managers are focussing on robo-advice and other automated and digital advisory services.
- From a market infrastructures perspective, a closer relationship to customers, potential new business segments, improved knowledge and increases in efficiency are ultimately considered as opportunities arising from digitalisation.

Potential emerging business segments by sectors in the next three years:

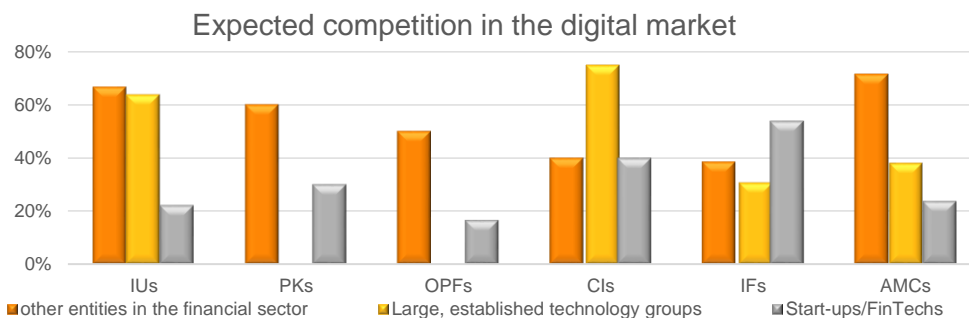
	<i>IUS</i>	<i>PKS</i>	<i>CIS</i>	<i>IFS</i>	<i>OPFS</i>	<i>MCS</i>
1.	IT-supported insurance products	Cross-border activity and PEPPs	Big data & analytics	Robo-advice & other automated and digital advisory services	-	Robo-advice & other automated and digital advisory services & new revenue channels
2.	New delivery channels		Marketplace via financial portals or online market places/ Expansion of online business	Digital portfolio management		Digital asset management or using CIs and big data applications for research and fund management
3.	Digitalised assistance processes		Operations or servicing of all channels	Retail business		Individual setting of priorities (e.g. blockchain, data providers)

E. Digital competition

The increasing level of digitalisation also has the effect that new competitors to some extent from outside of the industry are expanding into the the individual sectors in the financial market. In order to **be able to continue to win over their customers**, it is important for the **traditional players**, to recognise the disruptive potential of such newcomers – FinTechs / InsurTechs, as well as global technology companies – in a timely manner and to correctly position themselves as the competition.

The estimations about which players may become the largest competitors in the medium-term in the digital financial market, diverge strongly from one financial sector to another.

- The largest asset managers - occupational provision funds and asset management companies – assume that **other players from the financial sector** will constitute potentially the largest competitors in the medium-term.
- Insurers assess both financial services provider as well as large established technology groups as being their most significant competitors.
- Every second bank considers large **technology groups** as the largest competitors in the medium-term, and a further quarter view financial sector entities and FinTechs as the most apparent competitors.
- Only investment service providers (54%) consider **FinTechs** as their main digital competitor. In contrast insurers tend to consider FinTechs / InsurTechs as cooperation partners.

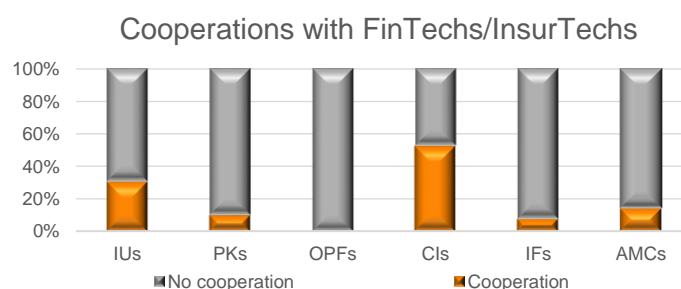


Where the disruptive potential of digital competitors has been detected, established players may choose to pursue different strategies in relation to these FinTechs/InsurTechs, e.g.

- Participating in FinTechs, e.g. by means of venture capital,
- Cooperation such as in the form of distribution partnerships,
- Confronting new competitors by means of their own digital innovations.

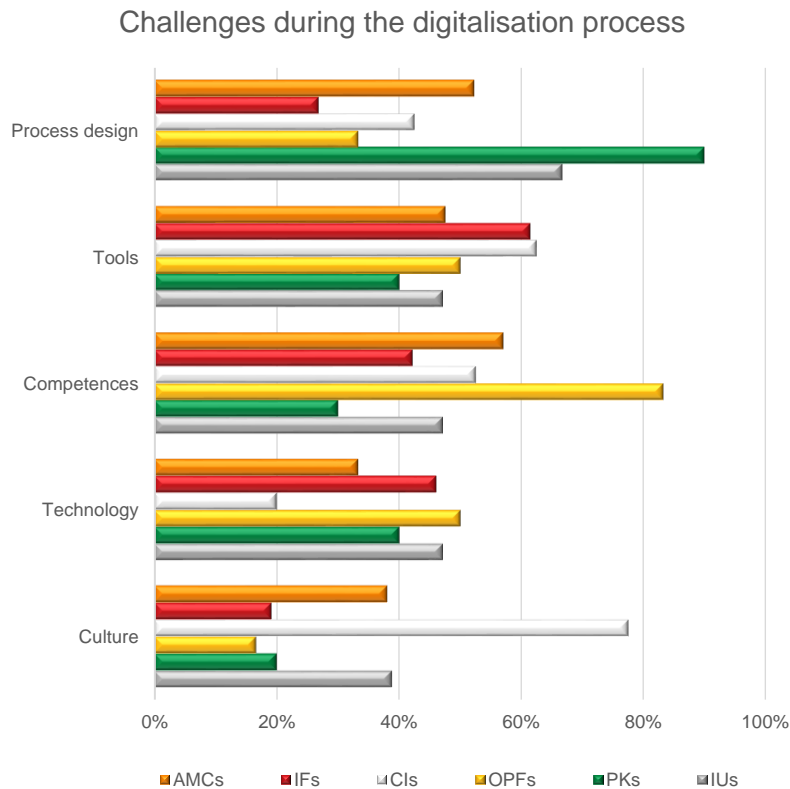
Predominantly banks and insurance companies are entering into cooperations with FinTechs/InsurTechs. This correlates with their fear that globally dominant technology companies like Google, Amazon & co could infiltrate the financial market as digital lateral entrants – and here in particular the market for payment services.

- More than half of the banks (52%) and almost one-third of the insurance companies (30%) are cooperating with at least one FinTech/InsurTech.
- Such cooperations are currently playing a far less significant role in the other sectors.



F. Challenges in Implementation

Supervised entities expect large organisational challenges for their organisations as part of the digitalisation process. Such challenges are most strongly observed in the fields of process design, existing IT tools and software as well as the know-how and digital competences that are available in the entity:



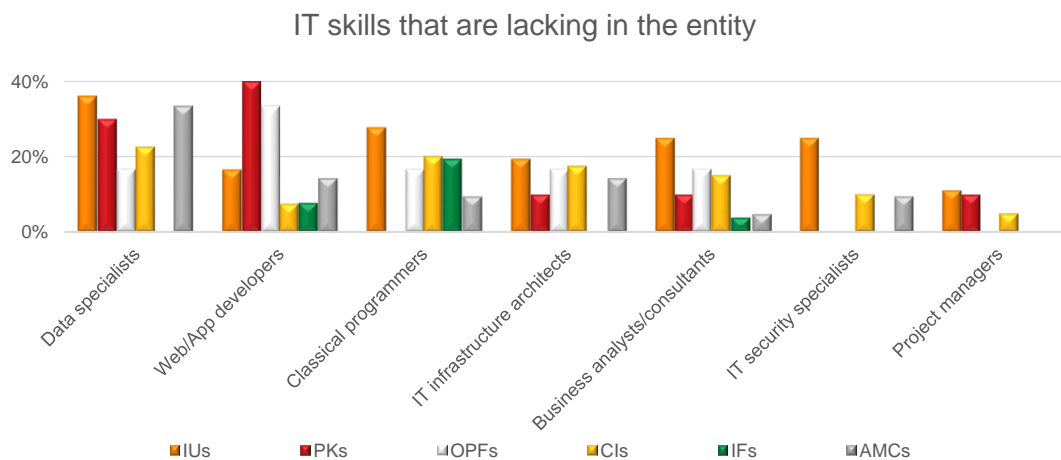
The challenges associated with digitalisation vary by financial sector:

- **Process design** and its optimisation for automated working processes are especially viewed as the most significant challenge by Pensionskassen (90%) and insurance companies (67%).
- A particularly high amount of banks - approx. 78% - view the necessary changing of the **corporate culture** as a particular challenge.
- The request for more modern and more easily usable **software tools** is most strongly prevalent in banks and investment service providers (over 60%).
- 71% of occupational provision funds stated that the **digital competences** – the skills of their employees – must be strengthened in the future.

The greatest need for know-how is perceived to be in the field of data structure and analysis specialists. A quarter of the financial market identifies a need to catch up in this regard.

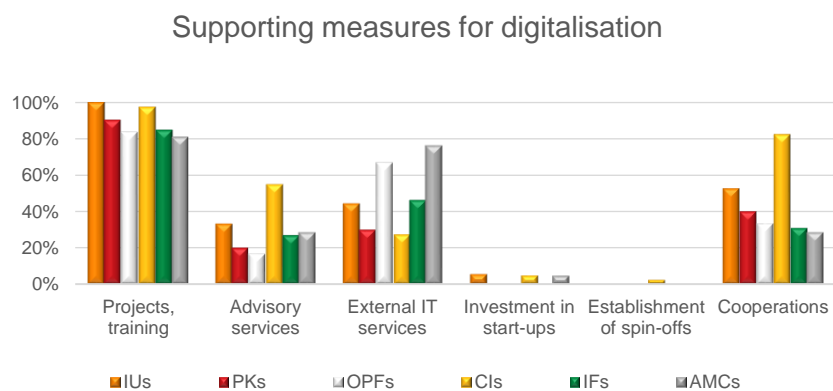
- In particular insurance companies (36%) state that they have a lack of data specialists, with 33% of asset managers and the 30% of Pensionskassen also expressing this view.
- 40% of Pensionskassen and 30% of occupational provision funds are currently looking for web developers and developers for mobile apps.
- Investment service providers generally only report a very low need for specific IT know-how, and “classical” developers are the more widely sought after (approx. 20%).

- In the field of IT security, a noticeably high number of insurance companies (25%) state that they are seeking such skills. Apart from ca. 10% each in the case of banks and asset managers, no entities at all in other sectors reported such staffing needs.



G. Measures for the Implementation of Digitalisation

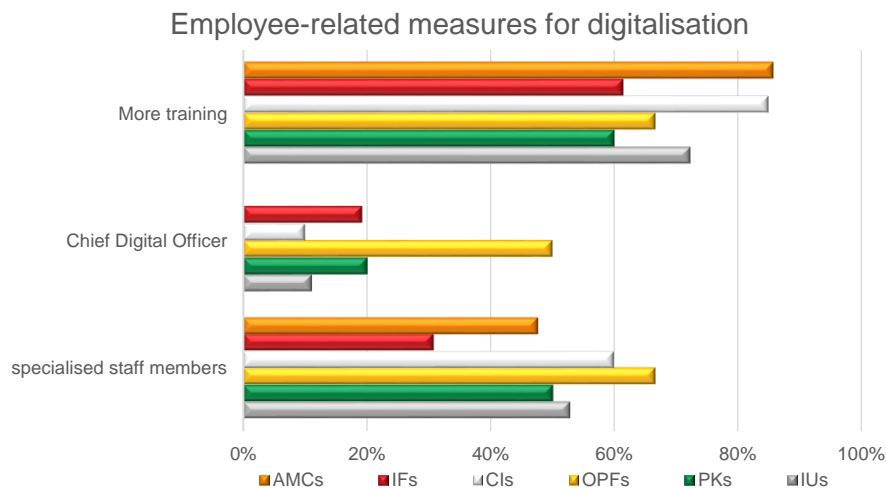
The digitalisation of a business model may be performed in a broad manner of different ways. The question also arises in the case of the measures for the implementation of digitalisation for entities of whether they primarily wish development to take place internally, or whether they (also) want to make use of external cooperations.



- Nearly all supervised entities are implementing internal measures such as projects, **increasing of know-how** etc.
- Just under half of the banks surveyed as well as all three market infrastructures are additionally increasingly making use of **advisory services** to assist in the digital transformation. This trend is considerably less strongly detectable in the other financial sectors.
- The **establishment of spin-offs** and **investment in FinTechs** has practically no significance for the entities that have been surveyed.
- In contrast 82% of banks consider **cooperations** as being relevant, with the insurance sector (approx. 52%) sharing this opinion most strongly. 52% of the banks are already actively cooperating with FinTechs.
- The **making use of IT services** is particularly widespread among asset managers (76%) and occupational provision funds (67%). Around just under half of the insurance companies and investment service providers, as well as approx. 30% of Pensionskassen and banks are increasingly making use of IT services.

Continuing training of employees is one of the most important measures for being fit for digitalisation. The focus of such training is about awareness in regard to digitalisation including agile development methods (priority 1), digital distribution as well as IT security (priority 2) and data analysis and process optimisation (priority 3). Big data and other IT-related topics are currently not reflected in training programmes.

The following trend has been observed with regard to the impact of digitalisation on employees:



- Just under half of the supervised entities also employ **staff members specialising in digitalisation**. Investment service providers are the only strongly divergent sector, with only ca. 31% of such entities highlighting that they increasingly want to employ such specialised staff members.
- On the other hand, less than 20% of the surveyed entities envisage introducing the position of a “**Chief Digital Officer**”. In the case of banks, this figure falls to a mere 10%, and no asset management company currently intends to create such a position. This approach only appears popular among occupational provision funds, half of whom plan to appoint a CDO.

H. Summary and Action Areas for the FMA

With what strategies are the entities approaching digitalisation? And what opportunities and threats do they see - or not see? These questions are also significant ones for the FMA. In terms of strategies the decisive factor is whether supervised entities are able to profit from opportunities arising from digitalisation or whether risk override for the Austrian financial market.

A quick look at the Austrian financial market shows that supervised entities generally class digitalisation as a very relevant topic and are willing to take measures to be able to exploit this development for themselves.

- In so doing, the entities have both recognised the **opportunity**, of being able to profit from new technical capabilities, as well as the **risk**, of falling behind the competition, in relation to digitalisation. The latter aspect is also additionally emphasised by the entities’ estimation that the competition in the future will no longer only be with the established providers in the financial sector. New competitors, primarily FinTechs/InsurTechs and large globally active technology companies will also line up alongside them.
- Digital transformation is perceived as being an **evolutionary process**. Supervised entities in Austria do not expect any disruptive changes to the financial market in the medium-term – i.e. within the next three years. From the perspective of the existing player a certain amount of time is available to adapt their organisations, business models, their know-how and their technical systems.

- Further technical development is considered as the driver of digital transformation - a push factor of digitalisation. Consequently entities also view the opportunity in digitalisation to be able to design their own processes more efficiently. Process optimisation is therefore viewed as the most significant challenge. Customer wishes - the pull factor - are only indirectly viewed as a driver.

The supervised entities' digitalisation strategies provide the FMA with several areas for action:

Actively following drivers of potential disruptive transformations and strategies of supervised entities:

- The risk exists that supervised entities will rely too heavily on development being of an evolutionary nature and will therefore undertake necessary changes too slowly or fail to take them. Material developments might be overlooked by concentrating heavily on internal aspects - and only having a marginal focus on changed customer expectations.
- This risk may potentially prove hazardous to their existence – to a greater extent than an inadequate capital base or deficient business conduct. The FMA must therefore keep the digital transformation of supervised entities in view - and accompany it where this is covered by the respective objectives of supervision.

Consolidation anticipated as a result of cut-throat competition:

- Even away from disruptive transformations increased competitive pressure throughout the entire value-creation chain of financial services may lead to further market consolidations or established providers being squeezed out. The FMA must anticipate this development and must recognise the risks for supervised entities in a timely manner.

Allowing structural transformations to flow into the observation of risks for the market as a whole and individual undertakings:

- New players (FinTechs / InsurTechs) gain significance due to the fragmentation of the value-creation chain. New **interdependencies** are emerging between the supervised entities and the service providers in the financial market. If new providers are concurrently used by several supervised entities, then synergy effects and economy of scale effects may arise, although such effects may also result in a high concentration risk. The FMA must dedicate considerable attention to such interdependencies as part of its risk-based approach to supervision.

I. Consultation about Strategy

How do you view the impact of digitalisation on the financial market?

Do you share the view of the financial market participants that disruptive transformations (i.e. the fundamental principle of the core business being replaced) is unlikely to occur in the financial market within the next three years?

In which areas do you expect disruptive developments?

In your view, do material impediments to digitalisation exist that must also be addressed?

What is your expectation regarding the role of the supervisor in the individual financial market sectors?

From your perspective, what factors are decisive for the success of the entities active in the financial market to optimally use digital transformation for developing their own business model further? Do you agree with the FMA's conclusions in relation to the strategic measures?

II. NEW PROVIDERS - FINTECHS / INSURTECHS

Digital transformation has opened up the financial market to new competitors. FinTechs / InsurTechs have solutions, offerings and business models at their disposal that allow traditional processes and services in many areas to be more efficiently designed, or even to render them obsolete. This upheaval provides new opportunities for FinTechs/InsurTechs and established players: they are able to also drive digital transformation themselves, tap new sources of revenue and place themselves at the forefront of development.

A. The Market: who are the players?

FinTechs / InsurTechs do not need to consider existing architecture, in many cases are not required to hold a licence and are not supervised by the FMA, and therefore need less or even no physical infrastructure. FinTechs are redesigning the distribution of financial products, by being able to fulfil customer expectations by agile processes and a higher degree of customer orientation, and also accelerating the tempo of innovation. A particular high number of FinTechs / InsurTechs are active in the USA, UK and Israel. A few have even already become internationally active players.

Payment services, with their lower barriers to entry (ZaDiG 2018) in comparison to banking (BWG) and the enormous quantity of comparable transactions have also been the focus of FinTechs from the outset. The largest growth area have been debit and credit card payments via smartphones or tablet devices. In addition to payments, FinTechs also offer account management products, as well as for loans and financing as well as for asset management.

B. Strategies of established players with regard to FinTechs

What possibilities exist for supervised entities? One strategic option that exists for supervised entities is to directly invest in FinTechs, such as by means of venture capital financing - or to establish FinTechs themselves as spin-off ventures from existing business operations. This option has only been taken up by a few undertakings in the banking, insurance and asset management sectors in the Austrian market. Well-known examples include the accelerator programmes of large banks or venture capital programmes set up together by insurance companies and banks. However, the sums that are required to be invested to do so mean that this option is only available to larger undertakings.

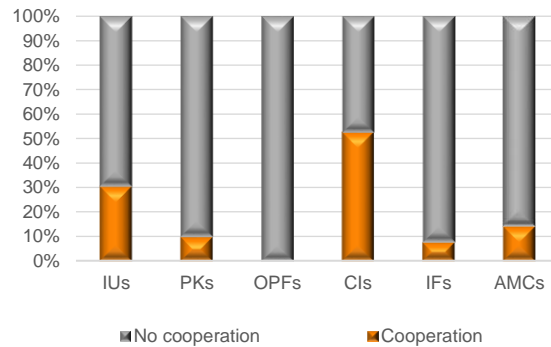
The more widespread strategy in the Austrian market for how to deal with new competitors is that of cooperation in individual business areas. The scope of the cooperation therefore differs considerably by sector being observed:

- 53% of banks state that they cooperate with at least one FinTech.
- Similarly, 31% of insurance companies have also entered into at least one such cooperation arrangement.
- In contrast only 14% of asset managers, 10% of Pensionskassen and 8% of investment service providers are cooperating with FinTechs / InsurTechs.

Furthermore the market overview shows that:

- cooperation is almost exclusively with European FinTechs, with the overwhelming majority being FinTechs from German-speaking countries;
- apart from in a few exceptional cases, the cooperation has only existed since 2017 at the earliest;
- the areas in which FinTechs are active are very diverse, ranging from the provision of API interfaces under PSD II, digital authentication (identification checks) as well as authorisation, various kinds of payment apps and big data analysis, through to IT security, data protection programs, data analysis tools or programs for switching of accounts online.

Cooperations with FinTechs/InsurTechs



C. Opportunities:

Areas	Explanations & Examples
<i>Rapid deployment of technology</i>	<ul style="list-style-type: none"> □ Established companies are able to profit from cooperations with FinTechs / InsurTechs from the latter's know-how and new technology □ The technology risk involved is limited
<i>Cost effectiveness</i>	<ul style="list-style-type: none"> □ There is no necessity in newly founded companies to replace potentially out-of-date IT systems. Other change management requirements e.g. in relation to organisational adaptations to generate cost savings are not necessary.
<i>Quicker execution</i>	<ul style="list-style-type: none"> □ 60% of those surveyed see strong changes to be ahead in relation to payments. FinTechs provide technology-based payment processes and mobile applications for a quick and simple settlement of payments. □ Fintechs may comply with customer wishes for security in making payments by using biometric identification and special encryption technologies. □ Optimisation of customer contact, e.g. by establishing digital distribution channels
<i>Exploiting new opportunities and new markets for customers</i>	<ul style="list-style-type: none"> □ FinTechs are able to offer less prosperous customers asset management services by analysing complex financial data. □ The business model of the account information service provider (AISP) was anchored in a legal basis in 2018 in the Payment Services Act (ZaDiG). It allows customers to gain a quick and simple consolidated overview of their financial situation. At the same time the payment initiation service (PIS) model is also defined, which opens up an alternative to card-based payment transactions. □ Big data permits the development of personalised products and services and improves the accuracy of risk evaluations.

Specialisation

- FinTech/InsurTech business models usually serve individual steps in the value-creation chain, by offering specialised solutions. From the perspective of the supervisor this constellation is primarily handled in conjunction with “outsourcing”. The innovations relate to the following aspects: products and distribution, assistance for business processes, compliance, data analytics.

Incentives for the supervised entities to remain competitive.

- PwC’s 2016 Global FinTech Report identifies the reduction of costs and increased customer retention and differentiation as the largest opportunities for the financial sector in relation to the growing significance of FinTechs.
- Furthermore, some credit institutions also see potential in new forms of scaling (a quicker go-to-market, larger customer segments, new forms of financing).

D. Threats

<i>Areas</i>	<i>Explanations & Examples</i>
<i>Fragmentation of Value Creation</i>	<ul style="list-style-type: none"> □ As a result of increasing cooperations with and outsourcing to external service providers cannibalisation effects are possible in the existing business models and undertakings.
<i>Dependence on external providers</i>	<ul style="list-style-type: none"> □ A FinTech/InsurTech, with whom a cooperation has been entered into may fail. □ A FinTech/InsurTech that has taken over the performance of an important business process may unexpectedly terminate the cooperation.
<i>Loss of know-how</i>	<ul style="list-style-type: none"> □ Established undertakings that rely on cooperation with FinTechs/InsurTechs for the deployment of innovative digital business models may miss the incentive to build up competences in house. □ As a result the attractiveness of the undertaking may suffer for technology savvy staff members and technicians.
<i>IT risks</i>	<ul style="list-style-type: none"> □ The technical interface between established undertakings and FinTechs/InsurTechs may be vulnerable to business interruptions of cyber attacks. □ The complexity of the IT environment increases as a result of a cooperation with FinTechs / InsurTechs.
<i>Data protection</i>	<ul style="list-style-type: none"> □ In the case of cooperations access to the customer data held by the supervised entities is usually provided. The risk therefore increases of unauthorised parties obtaining access to sensitive data.

E. Summary and Action Areas for the FMA

New innovative providers are entering the Austrian financial market in the form of FinTechs and InsurTechs, and also create new opportunities for established supervised entities. Business models can be overhauled and more efficiently designed by such cooperations throughout the entire value-creation chain. The associated opportunities and threats open up a range of action areas for the FMA.

Actively accompanying digital transformation in the Austrian financial market; actively communicating the rules of the game.

- FinTech/InsurTech business models may also be offered by undertakings that neither hold a licence nor are subject to supervision, and are often provided in cooperation with market participants that hold licences. It is frequently not easy to delineate which approach applies, so the FMA therefore considers it its task to provide support to FinTechs/InsurTechs in clarifying what is possible. The FMA has established the **FinTech Point of Contact** as the central entry point for questions that are relevant in relation to supervisory law, and which is constantly adjusting the information offered to match regulatory and market requirements.

The Implementation of the Sandbox:

- A regulatory sandbox is also intended to be established at the FMA, to allow undertakings to establish how business models that are currently under development may be realised in regulatory terms (c.f. Article 23a of the draft amendment of the FMABG).

Allowing new interdependencies to flow into ongoing supervision and risk classification:

- The business models of supervised entities are changing as a result of the **cooperation with FinTechs / InsurTechs**. The FMA must adjust itself to a higher level of complexity and allow such new interdependencies to flow into its risk perspectives in relation to entities and the financial market as a whole.

F. Consultation about New Providers

How do you assess the implications of the entry of new digital competitors into the financial market?

In which business areas do you assess that the new players will become materially significant within the next three years?

What developments do you expect regarding the relationship of established players and new players?

What advantages may be created for the customers from your perspective by testing of business models that are currently under development in a sandbox environment? From your perspective, is there a need for more detailed information and where applicable the involvement of customers in the sandbox?

Do the risks and opportunities identified by the FMA correspond to your perspectives, or what material deviations exist from your experience?

What is your expectation with regard to the role of the supervisor in the individual sectors of the financial market?

III. PRODUCT DESIGN

Digitalisation is creating an appetite for new product types. Customer behaviour is changing towards accessing services at any time, from any location via different channels. Increasingly networked devices, households and infrastructures create new demands on the design of products and services.

A. Banking Products

The results of the FMA's digitalisation survey show that banks in Austria classify digitalisation as a very relevant issue, and are willing to take measures to exploit this development for themselves. At the same time, the opportunity of profiting from new technical capabilities is appreciated, and the risk of falling behind the competition in with regard to this issue also recognised. The latter aspect is further emphasised by the expectation that the competition in the future will no longer solely be with other credit institutions. Those banks surveyed fear that large technology companies (e.g. Google, Amazon) as well as financial services providers might attempt to tap the market with their own products. Digitalisation's greatest influence on product design is seen to be in having a better understanding about the customer by having more data about them and more points of interactions as well as on the basis of automation and saving in terms of resources.

1. Technology-driven product innovations

<i>Internet of Things</i>	<ul style="list-style-type: none"> ■ The Internet of Things (IoT) allows classical banking services to be connected to existing digital voice-activated assistants. Such products (at least in Austria) are not yet widespread, and currently only available with simple functions ■ A significant technological trend that is currently being observed is however voice-controlled interaction without manual input ("the age of air").⁵ It is safe to assume that digitalisation will also be reflected in this area at product level
<i>Artificial Intelligence (AI)</i>	<ul style="list-style-type: none"> ■ Automatic image recognition ■ Online opening of an account: in cooperation with external providers new customers can be identified using video-chat ("Opening of an account from the comfort of your couch").⁶ ■ Photo transfers: a few banks offer the option in cooperation with a FinTech to make a credit transfer photographing the relevant data.
<i>Machine learning</i>	<ul style="list-style-type: none"> ■ Banks use machine learning in particular in relation to the personalisation and improvement of their products.
<i>Blockchain-based applications</i>	<ul style="list-style-type: none"> ■ At product level such applications are currently not particularly widespread; and from a customer perspective crypto assets are the most prominent example for blockchain-based applications

⁵ Erste Bank, 6.7.2017, <https://www.erstegroup.com/en/news-media/news-views/2017/07/06/artificial-intelligence-augmented-reality-fintech-alias> ; https://www.santander.com/cs/cs/Satellite/CFWCSancomQP01/en_GB/Corporate/Press-room/Santander-News/2018/04/12/Santander-launches-the-first-blockchain-based-international-money-transfer-service-across-four-countries-.html.

⁶ Der Standard, 23.1.2017, <https://derstandard.at/2000051355606/Per-Selfie-zum-Konto-Banken-machen-mit-Video-Identifizierung-erst>.

2. New Types of Products

New technologies also allow new niches and products to be created (for example, almost all Austrian banks offer e.g. instant credit transfers by means of transfers of funds via smartphones [Zoin], a product of Payment Services Austria: once the Zoin app has been registered a digital wallet is used and money sent directly to contacts stored in the phone (also to other banks).⁷

Two new products are now subject to clear regulations with the entry into force of the Payment Services Act 2018 (ZaDiG 2018):

- account information services, which allow a comprehensive and consolidated statement about payment accounts; and
- payment initiation services, with which payments may be triggered using third-party providers.

Both these innovative and new types of services or products will be offered in the future by banks as well as by third-party providers. Third-party providers wanting to offer such types of services, must be licensed by the FMA.

B. Insurance products

Traditional insurance products are now being converted to new technologies (digital transformation) due to increasing level of digitalisation. On the other hand the technologies themselves are leading to new insurance products that are being gradually launched on the market.

1. Parametric Insurance

In the case of **parametric insurance**, there is no need to check whether and for what amount the insured person has actually sustained damage. Instead the agreed amount becomes due as soon as a certain parametric trigger is reached.

Triggers may include e.g. a certain amount of precipitation, a certain level being reached, or wind or earthquake strength at an agreed upon measuring station. To date corporate risks that were not able to be insured against were able to be insured by the further development of triggers and compensation structures as well as due to advancing in data processing systems (e.g. operating interruptions without preceding material damage, cyber risks, product recalls as well as risks due to weather damage or energy prices).

<i>Opportunities</i>	<ul style="list-style-type: none"> ■ Damage checks are not necessary ■ High potential for automation, efficient risk transfer ■ New areas capable of being insured (e.g. intangible assets) ■ Low administrative costs and low costs to settle the claim
<i>Threats</i>	<ul style="list-style-type: none"> ■ Availability of data constitutes an enormous challenge. Technical advancements such as remote sensing and big data may yield improvements in this regard

⁷ Der Standard, 20.9.2017, Zoin: Sofortüberweisung als Feature zum Geldtransfer über Smartphones, <https://derstandard.at/2000064349794/Zoin-Sofortueberweisung-als-Feature-zum-Geldtransfer-ueber-Smartphones>.

2. Behaviour-based Products

By analysing large volumes of data, risks can be analysed in real time on the basis of individual behaviour. The estimation of risks will become an increasingly exact process, and the consequently the calculation of premium will be far more individually tailored. While in the meantime in the motor vehicle insurance sector several undertakings are offering telematic tariffs in the market, such activities in other insurance areas, which are based on big data applications, are still comparatively less widespread. A few examples:

- **Smart homes** are networked and can be centrally controlled. Blanket statistics are no longer exclusively used to calculate the cost of household insurance, but instead more detailed data (behaviour data, environmental data, claims data etc.) which are correlated with one another are used, allowing more valid conclusions to be drawn.
- **Usage driven insurance:** insurance companies base their offer on usage behaviour, such as driving behaviour and the kilometres driven by the insured person.
- **Pay as you live:** insurers can actively assist support their customers to live healthily by means of additional offers, and therefore to take on a more active role.

3. On Demand Insurance

An ever increasing amount of intelligent technologies will be integrated into everyday life in the coming years, which is intended to ensure greater comfort, save time and make life simpler. In the case of insurance “on demand” customers should be able to activate and deactivate their insurance cover for the objects captured in an app from their smartphone, and therefore be able to determine the duration of cover themselves. By establishing new IT infrastructures and using available data the product environment of the IUs will move away from standardised tariffs and modules towards more strongly individually tailored insurance cover.

<i>Opportunities</i>	<ul style="list-style-type: none"> ■ The customer only uses insurance when he/she actually needs it and uses it for exactly as long as he/she requires it. ■ Risk awareness increases ■ Rapid and case-specific coverage with flexible contract term ■ feedback effects to the previously traditional insurance business
<i>Threats</i>	<ul style="list-style-type: none"> ■ Negative risk selection ■ Transparency and clarity towards customers

4. Blockchain-based products

The most significant advantages of Blockchain technology are “intelligent” insurance products, better evidence in cases of fraud, and simpler pricing. Computer logs are used to technically depict contractual arrangements in such a way that the clauses in the contract may be partially or completely executable.⁸ Blockchain technology can specifically be used in product design for example for the following purposes: settlement of payments, notarising of documents and identities, implementation of smart contracts: business transactions could be conducted in a fully-automated way from the conclusion of the insurance contract through to the paying out of the benefit.

⁸ Cf. in this regard for example *Ghosh/Ott/Sandner*, Digitalisierung der Versicherungswirtschaft mit Blockchain und Smart Contracts; FSBC Working Paper (2017).

5. Community based insurance

Community-based insurance reverts back to the very origins of the insurance industry, where certain community groups such as families or village communities provided mutual assistance in the case of claims arising. The innovation lies in the fact that such types of insurance can be conducted through other channels in the era of computers and mobile phones.

With the help of digital opportunities (P2P) persons can be brought together to form small groups. Damages for amounts that are less than the amount of the excess are split among the collective. Only in cases of larger damage amounts does the protection in the insurance policy take effect.

<i>Opportunities</i>	<ul style="list-style-type: none"> ■ Ease of access to insurance cover may be simplified. ■ Modern technologies and the “Internet of Things” simplify private persons’ access to goods and services; the sole provision of insurance cover is possible from technological perspectives without further ado. ■ A no claims bonus creates positive incentives against committing insurance fraud while also saving costs.
<i>Threats</i>	<ul style="list-style-type: none"> ■ Adverse selection of insurance risks ■ Regulatory “grey area” ■ Competent and financially sound carrier undertakings must exist

6. Products based on the sharing economy

The term “the sharing economy” is an umbrella term covering firms, business models, platforms, online and offline communities and practices, allowing the shared usage of resources that are partially or fully unused. Using goods or services through sharing economy platforms may belong to the more recent trends, but almost 680 million people have already jumped on this new bandwagon, as stated in the recent study by Lloyd’s in cooperation with Deloitte⁹. However, whatever is shared also needs to be insured.

The increasing significance of business models from the sharing economy may lead to insurance benefits increasingly being attached to usage and far less to the ownership relationship of goods.

<i>Opportunities</i>	<ul style="list-style-type: none"> ■ New insurance products
<i>Threats</i>	<ul style="list-style-type: none"> ■ Misuse and consequently other risk profiles ■ It is unclear in which form customers and sharing platforms bear risks ■ Complex issues arising with regard to insurance law ■ Processes for claims processing may become more complex

⁹ Cf. for example Lloyds und Deloitte (2018), Squaring risk in the sharing age: How the collaborative economy is reshaping insurance products.

7. Cyber insurance

The flip side of digitalisation, which leads to a constantly increasing usage and networking of information and communication technology, is the increase in cyber crime. Digital attacks are occurring ever more frequently with the intention of gaining a benefit and may constitute a considerable risk (cyber risk) for entities as well as private persons.¹⁰

Cyber crime presents a material new risk for the insurance industry in particular, above all in relation to business models and the sensitivity of customer data. On the other hand cyber crime, unlike in other industries, may also provide an opportunity for insurance companies in the form of cyber insurance products.

<i>Opportunities</i>	<ul style="list-style-type: none"> ■ Risk awareness ■ Large potential both by providing protection against cyber attacks as well as providing support in the event of a successful cyber attack
<i>Threats</i>	<ul style="list-style-type: none"> ■ Calculation of premiums is difficult due to the lack of experience with claims as well as the rapidly changing environment

8. Crypto assets policies

The need for insurance coverage has increased in light of hacker attacks and stricter regulation of crypto assets. Demand for insurance against “crypto currency fraud” has increased not only since half a billion dollars were stolen from the Japanese exchange service Coincheck. Insurers in the USA and Japan are launching the first crypto assets policies on the market.

Since many of the risks surrounding Bitcoin and co are practically impossible to calculate, providers only provide cover for special circumstances: the loss of owner rights of crypto-tokens, but not the risks of losing one’s savings.

<i>Opportunities</i>	<ul style="list-style-type: none"> ■ New insurance products ■ Increasing of risk awareness ■ Better evaluation and estimation of risks
<i>Threats</i>	<ul style="list-style-type: none"> ■ Risks arising from “crypto currencies” are very difficult to assess

¹⁰ Federal Chancellery, Cyber Security Report 2016

C. Summary and Action Areas for the FMA

Digital transformation requires a stable foundation and legal clarity

The lack of legal clarity regarding the classification under supervisory law and possibilities in relation to digital transformation in product design must still be identified further and overcome. This also affects

- the weighting between the costs for a more far-reaching differentiation of premiums and the associated benefit that can be achieved by doing so by avoiding an anti-selection;
- the assessment about what room for manoeuvre exists on a permanent basis for the progression of the individual underwriting principle of equivalence and allows an associated ever more fine differentiation in premiums¹¹.

Technology neutrality does not exclude regulation

The supervisor should generally have a neutral positioning towards innovation and technological developments. The possibility is not however excluded of new regulations being published for certain innovations (e.g. in relation to “ethical” boundaries of digitalisation).

Product innovations require transparency

Digitalisation not only heralds innovative products, but to some extent also brings more complex products. To counteract the customers’ increased need for information and to make customers aware about the information requirements for providers and sensitive issues, the FMA must continue to push its consumer information.

Stimulating legal or socio-political debate in the case of the threat of financial exclusion

In the insurance industry, individually calculable premiums may massively threaten the insurance principle of equalisation of risks: good risks may become cheaper to insure against, while in contrast bad risks would become more expensive to insure. In extreme cases, individual risk-adjusted premiums could become prohibitively high.

Consequently the question arises about the extent of the existence of the danger in the future, that bad risks will no longer be insurable - with the threat therefore of partial market failure (Effects on financial inclusion and exclusion).

D. Consultation on Product Design

From your perspective, what duties should the FMA perform in relation to the protection of investors, insured persons and creditors with regard to “digital” financial products?

What specific regulatory standards are still necessary due to the digitalisation of the financial sector? Do data protection rules in particular need to be adapted or further refined?

From your perspective, what impediments exist in Austria that hamper the development of new digital financial products?

Do you share the FMA’s assessment with regard to the opportunities and risks associated with their impact on banking or insurance business?

What specific positive and negative developments regarding “digital” financial products can be observed from your perspective?

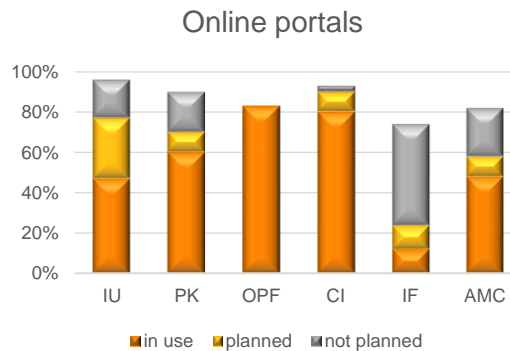
¹¹ This question is covered in particular in *Wagner*, Geschäft oder Gewissen? Vom Auszug der Versicherung aus der Solidargemeinschaft (2017).

IV. DISTRIBUTION / CUSTOMER INTERFACE

A. Trends observed in the various channels of communication

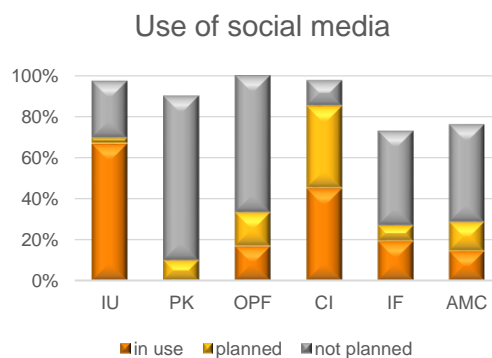
Overall, there is a strong trend towards the usage of personalised websites. This is most strongly visible in the case of CIs.

- Many banks use their general website as the first point of contact for information for customers and should be extended towards becoming a sales channel (web shop).
- Among the IUs, around half already offer their customers a personalised website; a further eleven IUs are planning to deploy such a personalised website. Websites also play an important role for OPFs and MCs as a initial source of information.
- This trend, however, is not the run of the mill in the securities sector. It is particularly noticeable that the overwhelming majority of undertakings does not show any interest in such technologies.



Social media are most frequently used in the insurance sector (67%)

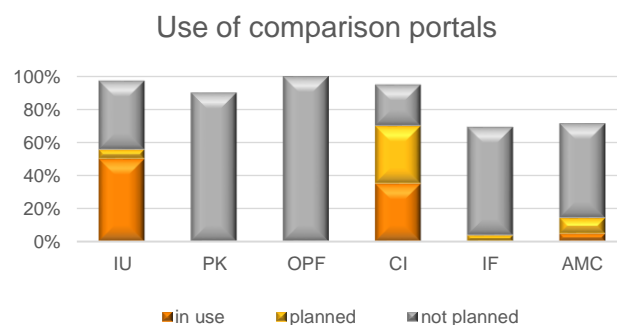
- Among CIs, almost half (45%) of providers already use social media, and almost all of the remaining CIs surveyed intend to use social media by 2021. Social media presences might become an important channel of support and communications (customer information) or may be used purely as a marketing tool. They are not viewed as a sales channel.
- Social media does not play any role for PKs, and only plays a minor role for the other sectors.



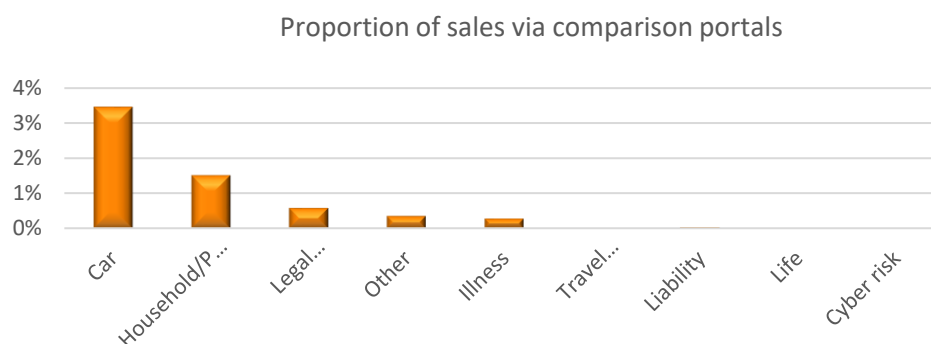
- Addition target groups can be reached using social media at lower costs, since a separate distribution structure does not need to be established. On the other hand reputational risk increases, since the dissatisfaction of individual customers can spread very quickly. It is therefore important to constantly monitor social media and a tailored social media communications strategy is important. Risks also arise from staff members' conduct on social media, since such conduct is attributed to the undertaking.
- In addition to the sectoral requirements regarding their market presences, in order **to avoid illegal content by third parties being attributed to them** (Article 16 para. 1 ECG), supervised entities must act without delay and remove or block access to such content as soon as becoming aware of its existence.¹²

Primarily it is IUs (exactly 50% of the IUs) that allow their products to be listed in comparison portals.

In recent years increasing activity of comparison portals has been observed in the Austrian market, which may primarily be traced back to the fact that customers show increased interest in obtaining an overview prior to the conclusion of a contract. Face-to-face consultations nevertheless remain an important factor in the sales process.



- In the insurance sector comparison portals primarily play a role in the distribution of motor vehicle and household/home contents insurance, but are also used for insurances to cover legal costs. Comparison portals only have minor significance for all other sectors.

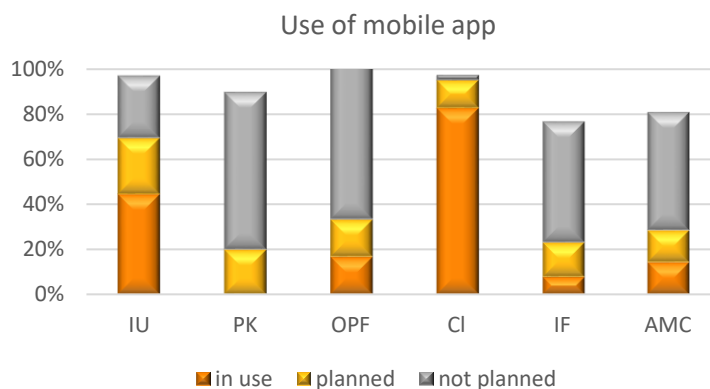


- CIs also use comparison portals, albeit to a lesser extent than IUs (14 of the CIs surveyed), however the same number again planning to use comparison portals in the next three years. The weakness of this means of communication might be the level of comparability of individual products is poor (e.g. in the case of package solutions).
- Comparison portals do not play any role whatsoever in the remaining sectors or are of a minimal significance.

¹² See also OGH, 6 Ob 244/16z as well as EuGH, 5.6.2018, C-210/16.

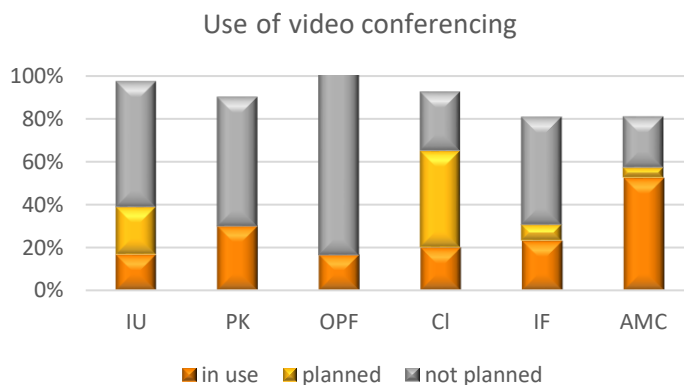
Apps for mobile devices are predominantly offered by CIs (83% of the surveyed CIs).

- All the remaining CIs bar one are planning to make use of apps in the next three years. It is planned to extend the functionality of apps (e.g. voice control, digital payment options) and to make them more secure (e.g. two-factor authentication (2FA)). Communications with customers and customer retention (e.g. customer experience management) should be improved in this way.
- An increasing trend has also been identified in the insurance sector for using apps to communicate with customers. 16 IUs already offer an app and nine further IUs plan to do so by 2021.
- The trend towards the (planned) usage of apps is lower among IFs, OPFs and management companies, with only around one-third of those surveyed planning to do so.
- No PK currently offers an app for mobile devices.



Video conferencing is currently predominantly made use of by MCs. In addition to customer identification, from the perspective of IUs their use for video-based advice is also conceivable.

- More than half (52%) of the surveyed MCs make use of video conferencing. They provide an adequate solution for reaching individual customers or cooperation partners directly.
- This trend is only distinct to a low level in the insurance sector. Six IUs are already using video conferencing and eight further IUs plan to make use of it in the next three years. For IUs the use of video conferencing would be conceivable for customer identification purposes as well as for video-based advice.
- Video conferencing will gain in significance for CIs in the future. It presents a possibility to expand customer service (in a location-independent way). Furthermore a trend is emerging towards a video-based identification procedure.
- Among IFs, video conferencing is actively used by 23% of the undertakings, and is therefore the most widespread form of new communications channels.



E-mail usage is assessed as being in decline in the future for reasons of data security and data protection.

- From the insurance industry's perspective, e-mail is used increasingly less frequently to contact customers.
- The issue of data security (with regard to signatures and encryption) also plays a significant role for CIs. 23% of the CIs surveyed assume the use of e-mail as a means of communication is if anything declining.
- In the securities sector, e-mails continue to play a central and therefore even an increasing role in customer communication, but a few isolated undertakings however expect this trend to decline in the future.

Telephony is also seen as being less prevalent by IUs. CIs on the other hand want to use voice recognition for customer identification purposes.

- 18% of the surveyed CIs assume that telephone calls will only play a minor role in the future.

The insurance sector is the only sector that uses chat bots (6 IUs).

- Chat bots are primarily used by IUs in pre-sales. In the future IUs would like to make use of chat bots to answer simple enquiries or to provide information about contracts. The advantages are in particular perceived in being reachable around the clock.
- Chat bots will become more important for CIs, but currently are still in the development stage. Customer services is intended to be expanded by using them (24/7 support). Chat bots are primarily intended for answering questions quickly. 15 of the surveyed CIs plan to use chat bots in the next three years, primarily in the areas of pre-sales and customer service.
- There is no observable trend about the use of chat bots in the remaining sectors.

Live chat is generally barely used, although there is a discernible trend towards the increased use of this technology among CIs.

- 25% of the surveyed CIs state that live chat with customers will become more significant in the future. Customer service is intended to be expanded further, and 24/7 support for customers (including bot solutions) established.
- A certain trend is also observable among IUs, although it is less marked than in the case of CIs. Currently three IUs use live chat, with a further 13 IUs planning to use it.

(Personalised) websites are increasingly being used as durable media.

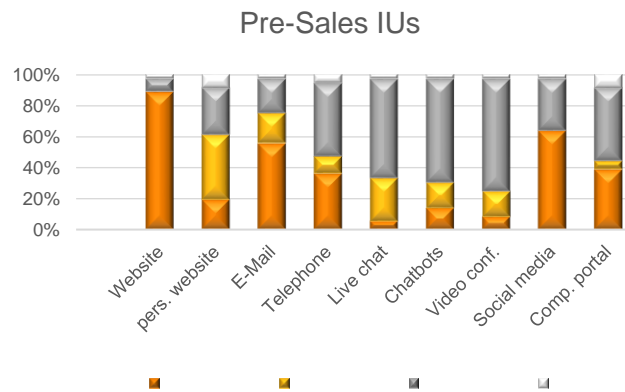
- **Personalised websites** (portal solutions) are increasingly being used by IUs as a "durable medium" (currently eight IUs). A further six IUs are planning to implement a portal solution. Two IUs state that they already use their **website** as a durable medium. One IU intends to use its website as a durable medium in the future. This trend is expected to continue to prevail in the future.

B. Digital Communication in Business Processes

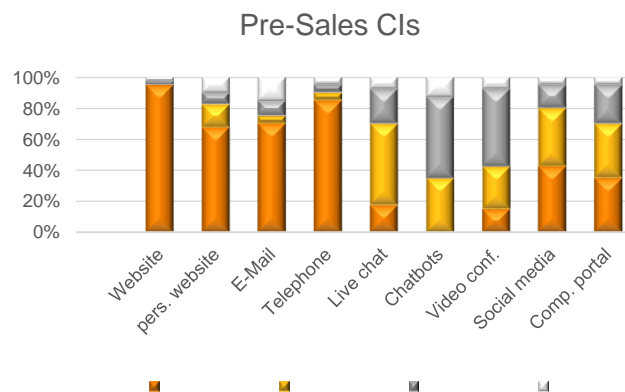
Depending on at which stage (advertising, sales, contract management or customer service or complaints management) communications occur with customers, there are varying preferred different communications channels used:

1. Pre-sales

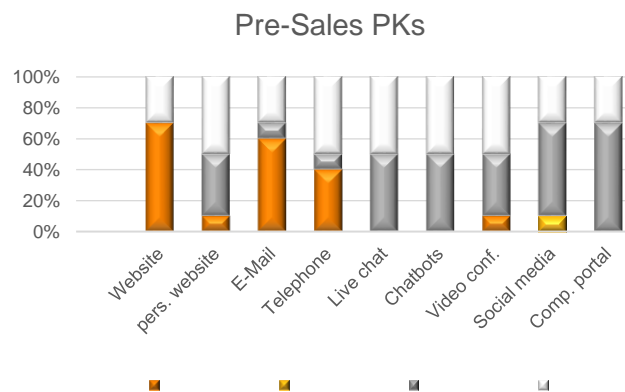
During pre-sales (marketing/advertising) **insurance companies** predominantly use websites, social media and e-mails. These channels of communication are widespread in the areas of life insurance, motor vehicle insurance, household/property insurance and legal costs insurance. There is a discernible trend towards more frequent use of personalised websites, live chat and apps for mobile devices, which will spread in the future to all insurance segments.



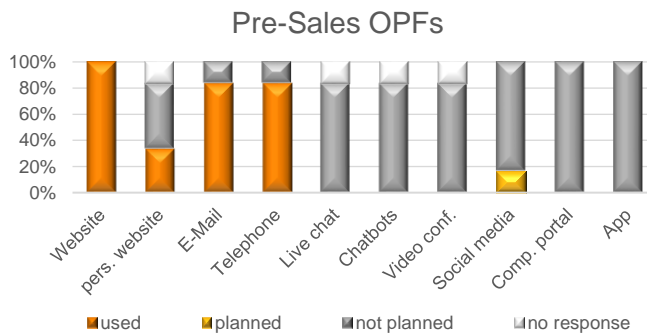
In comparison the most frequently used means of communication by **banks** in pre-sales are websites, telephony, apps for mobile devices as well as e-mails. Furthermore it is also planned in the next three years to make greater use of live chats with customers, social media presences and comparison portals.



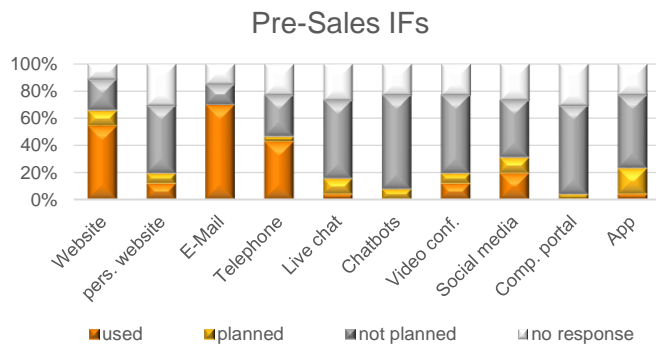
The **Pensionskassen sector** is characterised by the collective body, where an employer concludes a contract with a PK (for the benefit of third parties). The contractual partner and therefore customer of the PK is the employer, with the respective employees merely having claims towards the PK. It is therefore apparent that no trend is discernible regarding use of new technologies in pre-sales. Traditional means of communication are predominantly used in the PK sector such as websites, e-mails and telephony.



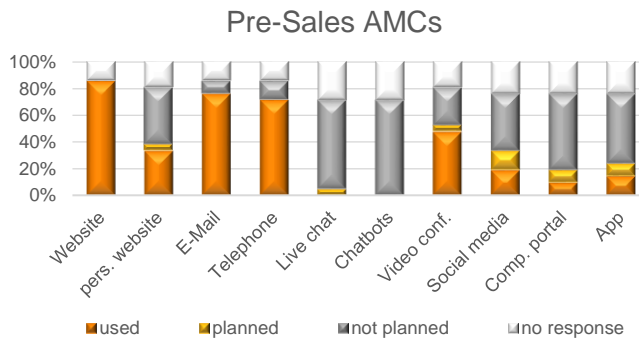
There is a similar situation among the **occupational provision funds**. In the OPF sector employers are also the contractual partners. Traditional means of communication are predominantly used and there is no discernible trend towards the usage of new technologies in pre-sales.



Investment service providers generally tend to use traditional channels of communication such as websites, e-mails and telephony, a trend also observable in the pre-sales process. 19% of undertakings also additionally make use of social media for this purpose.

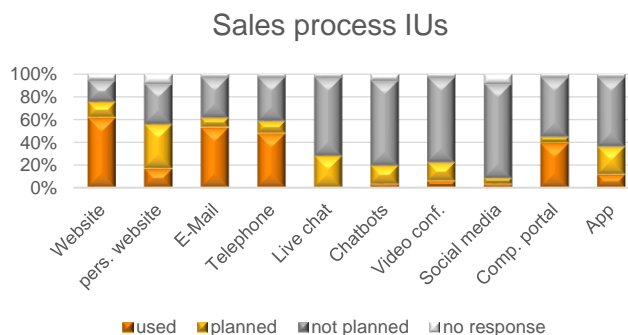


Asset managers also primarily prefer traditional means of communications with interest also existing in new channels of communication like social media, comparison portals and apps for mobile devices.



2. Sales process

In the sales process **insurance companies** primarily use websites, e-mails and telephony. Comparison portals are particularly used for motor vehicle and household/property insurance. As observed in pre-sales a discernible increasing trend towards the use of personalised websites, live chat and apps for mobile devices also exists, with insurance companies in all classes being interested in using apps for mobile devices in the future.



It is interesting that no insurance company currently makes use of live chat in its sales process, but ten undertakings state that they plan to do so in the next three years. Live chat could become more significant particular in relation to online advice.

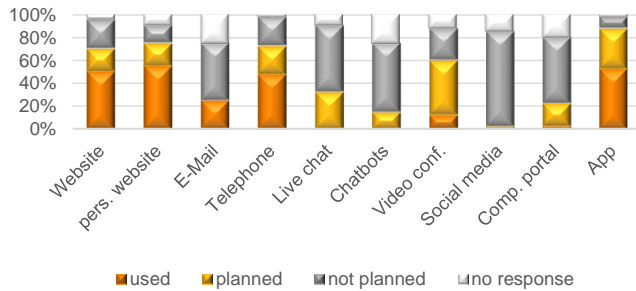
Among **banks** the use of digital means of communication for the conclusion of contracts is relatively weak. Currently, primarily (personalised) websites and apps for mobile devices are used, with these predominantly being used for the settlement of accounts. In the next three years is it planned to make greater use of apps for mobile devices, video conferences and live chats with customers.

Pensionkassen primarily use traditional means of communication to conclude contracts, with video conferencing also being used to a small extent. There is a slight trend however towards the usage of new technologies, such as live chat and apps for mobile devices.

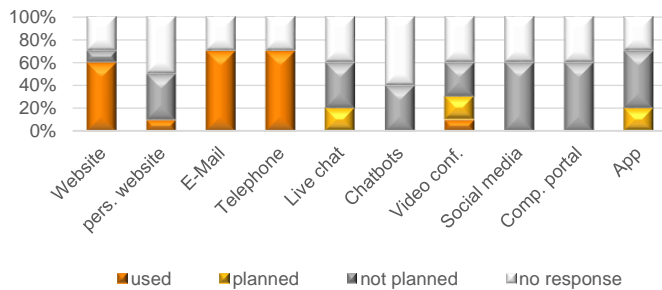
As with Pensionskassen, **occupational provision funds** prefer to use traditional means of communication, with live chat also being used to a low extent in the sales process. However, interest also exists in using new technologies in the future.

In the case of **investment service providers** the sales process predominantly occurs without recourse to digital assistance and appears to take place on site. Only a very small minority of the undertakings allow other channels to be used, primarily e-mail.

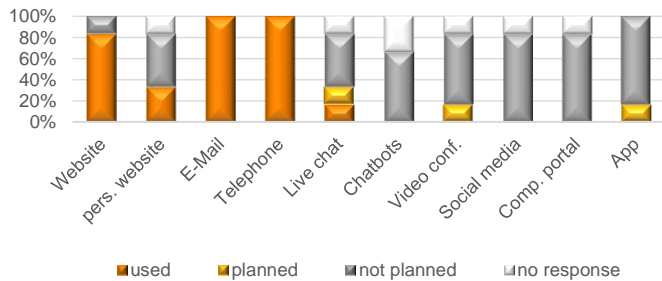
Conclusion of contracts CIs



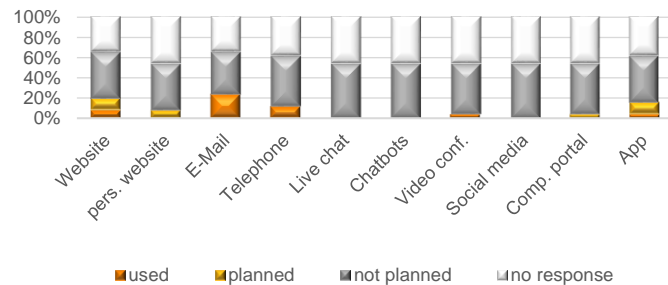
Sales process PKs



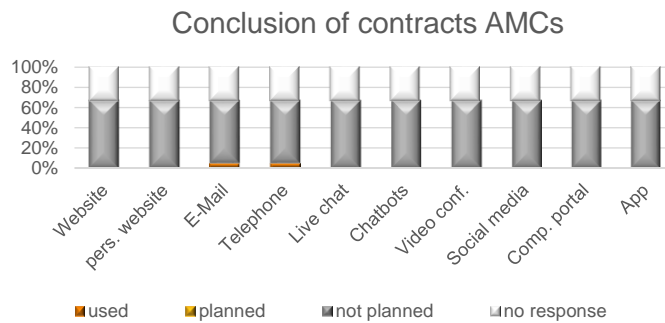
Sales process OPFs



Conclusion of contracts IFs



The least widespread use of technology-assisted means of communication is in MCs. Traditional means of communication such as e-mail and telephony are only used to a minor extent, since sales predominantly occur through cooperation partners.



<i>Opportunities</i>	<ul style="list-style-type: none"> ■ The deployment of electronic means of communication during the sales process provides a simplification for undertakings and customers alike. For undertakings there is a considerable cost-saving potential. ■ Electronic communications permit the tapping of new markets across country borders at low costs, since a separate sales structure is not required to be built-up. ■ Undertakings are able to react to requests and wishes from customers within the shortest period of time.
<i>Threats</i>	<ul style="list-style-type: none"> ■ Despite electronic communications methods customers in some areas continue to request documentation in paper form, or electronic submission is only possible where explicitly requested by the customer. This causes additional costs.
<i>Implications</i>	<ul style="list-style-type: none"> ■ Clear legal conditions are necessary for the arranging of electronic communications: <ul style="list-style-type: none"> □ Clarity is required in relation to separate granting of consent (for example pre-crossed selections would not correspond to this requirement) □ Clarity about the relationship between general approval regarding electronic communication as well as another requirement for approval to permit information to be made available through a website¹³ □ Clarity about the specific legal consequences in the case of the lack of consent being provided by the insurance policyholder regarding electronic communications □ Under what conditions is the contract deemed to have been concluded in a legally effective manner? ■ Different requirements and conditions for electronic communications in accordance with VAG and the PRIIPs Regulation¹⁴ as well as the necessity for separate requirements regarding consent.

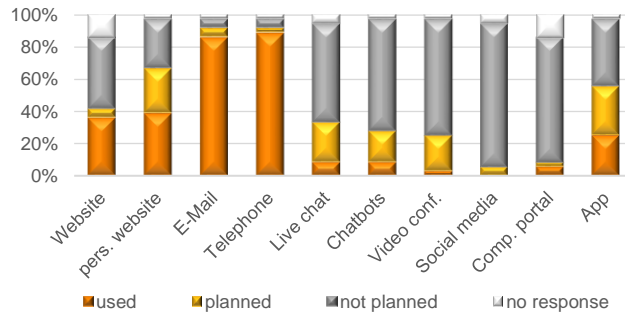
¹³Article 128a paras. 2 and 3 VAG.

¹⁴ Regulation (EU) No 1286/2014 of the European Parliament and of the Council of 26 November 2014 on key information documents for packaged retail and insurance-based investment products (PRIIPs).

3. Contract Management

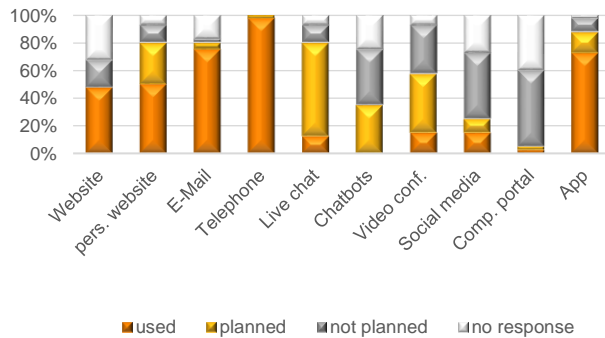
Insurance companies primarily use telephony, e-mail and personalised websites for contract management. The personalised website is viewed as being a material medium for existing customers and for customer retention purposes. An increased trend towards the usage of apps for mobile devices is apparent, and personalised websites are being increasingly used (esp. for live insurance, motor vehicle insurance and household insurance) as well as live chat and also chat bots.

Contract management IUs



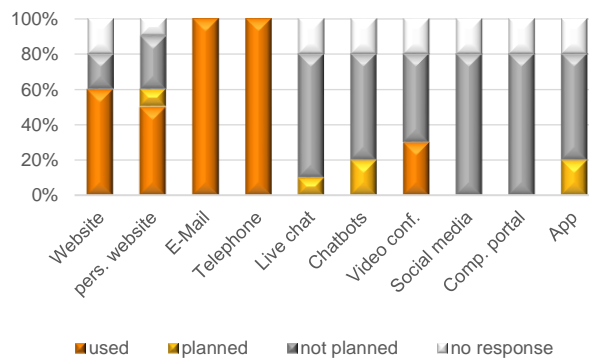
In the field of customer support, in the case of **banks** telephone calls (closely followed by e-mails and apps for mobile devices) currently play the most significant role among the means of communication. Live chats, fully-automated chat bots and video conferencing are intended to be used more in the future.

Customer advice CIs



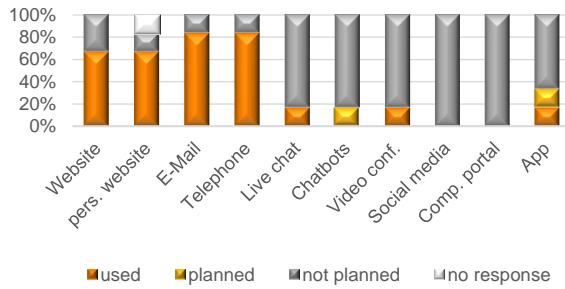
In the case of **Pensionskassen** e-mails and telephony play a significant role in contract management, although websites and personalised websites are ever more frequently being used. Undertakings increasingly request a digital information platform both for their employees and the human resources department. Administrative expenses have risen in particular during the course of the last five years as a result of more complex processes or stricter frameworks. The exchange of data with employers could be performed efficiently. An online platform could display all benefits and entitlements in a transparent and up-to-date manner.

Contract management PKs



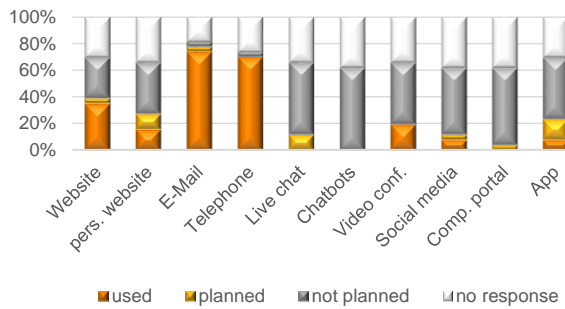
Occupational provision funds prefer to use traditional means of communication for contract management, and to a lesser extent also use live chat, video conferencing and apps for mobile devices.

Contract management OPFs



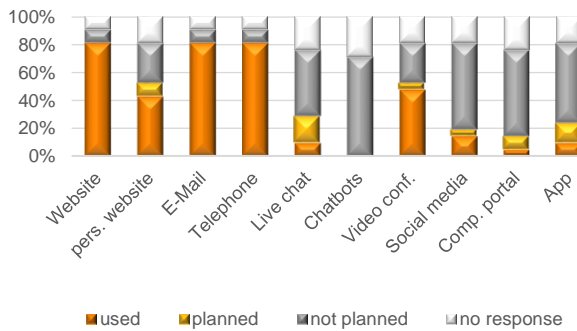
Investment service providers support their customer advice primarily by means of using e-mails and telephony. A few undertakings also use websites, but other technologies are generally only used in isolated cases.

Customer advice IFs



With regard to the conclusion of contracts, **asset managers** tend to use technology-based means of communication. Primarily e-mail, telephony and websites are used, as well as video conferencing and apps for mobile devices to a lesser extent. In the future apps for mobile devices, live chat and personalised websites could be used more for customer advice.

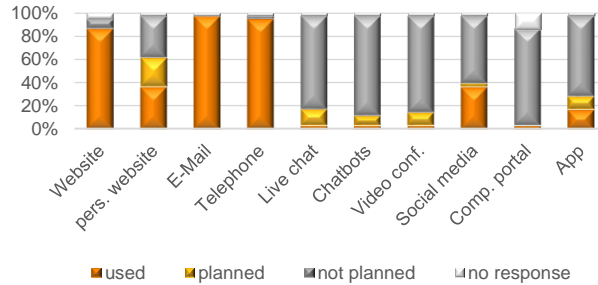
Customer advice AMCs



4. Complaint Management

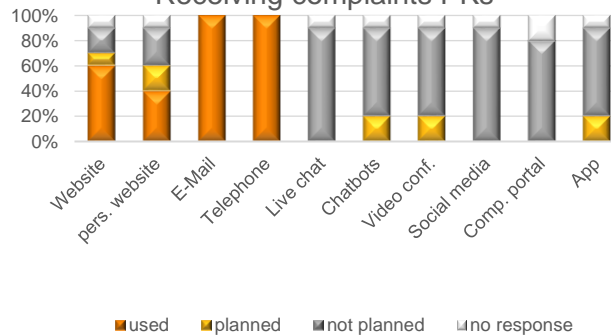
Complaints are accepted by **insurance companies** primarily by means of e-mail, telephone and through their website, as well as increasingly through social media. These channels of communication are primarily used in the fields of life-, motor vehicle and legal fees insurance. It is noticeable that - as is also the case in pre-sales that social media is increasingly being used to receive complaints. An increased trend towards the usage of personalised websites is also recognisable.

Receiving complaints IUs



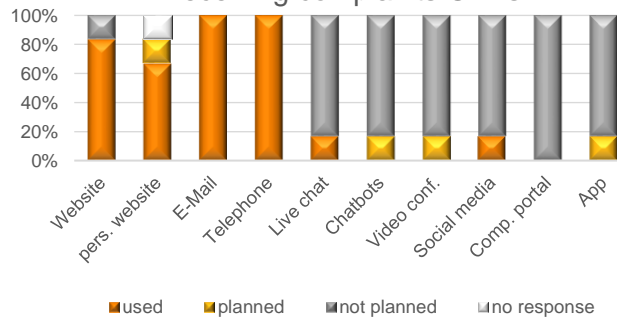
Pensionskassen predominantly used traditional channels of communication to receive complaints, as well as to a small extent using video conferencing. The use of chat bots and apps for mobile devices is also planned in the future.

Receiving complaints PKs



Like PKs, **OPFs** tend to make use of traditional means of communication, as well as live chat and social media.

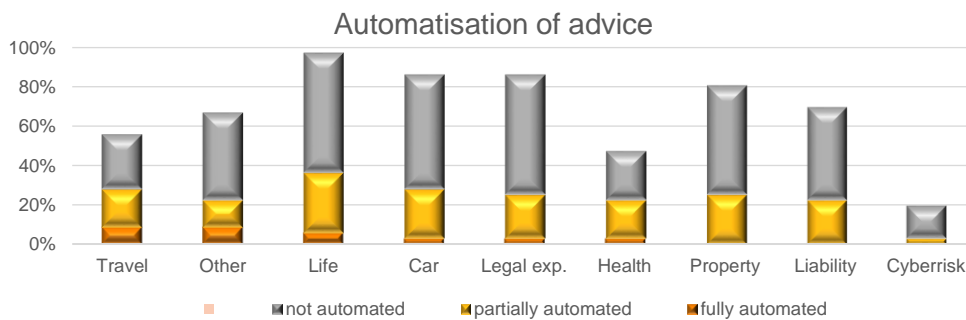
Receiving complaints OPFs



C. Robo-Advice

Fully automated advice is currently only being offered on a very limited basis by insurance undertakings, in particular in relation to travel insurance (3 IUs) and life insurance (2 IUs).

- Partially automated advice can primarily be found in life insurance (11 IUs), motor vehicle insurance (9 IUs) and household/property insurance (9 IUs). Partial automated advice is however also offered in the legal fee insurance (8 IUs) and liability insurance (8 IUs) sectors. The overwhelming majority of IUs offers advice through an adviser.
- A few IUs state that they have not yet conclusively clarified how in the course of an online advice process all legal requirements can be met (e.g. Needs assessments, advice, determination of identity, “obtaining of signatures”, GDPR).



<i>Opportunities</i>	<ul style="list-style-type: none"> Automated advice allows online distribution despite an obligation to provide advice. Simplification of working processes by means of automatic generation of minutes of customer meetings and recommendations. Increased efficiency: it is possible to find a suitable product more quickly by using advisory algorithms. The use of automated advice may lead to more cost-effective advice for customers. (Partially) automated advice may assist the advice process to find individual solutions for customers. The use of advice algorithms may permit advice to be conducted free of conflicts of interest. Observance of compliance guidelines may be documented more simply by using automation. Customer advice around the clock is possible.
<i>Threats</i>	<ul style="list-style-type: none"> A lack of customer confidence in automated systems esp. in the case of complex products and ones that are intensive in terms of advice. Customer concerns with regard to data protection, meaning that the necessary information required to be able to provide advice may not be supplied The threat exists of non-transparent decisions being made by using artificial intelligence

Implications

- What requirements under supervisory law exist for fully or partially automated systems and advice algorithms?
- Errors in either the algorithms or the underlying data may lead to systemic risks and may ultimately prove detrimental to the interests of the customers.
- Ensuring that the waiving of the customer's right to receive advice is not initiated by the IU¹⁵; a cause to waive the right to advice may for example exist in the case that the sales process cannot be continued without waiving the right to advice or where the approval to waive the right to advice has already been pre-selected
- Questions of compatibility with data protection regulations, in particular the possibility of recording fully automated advice.

D. Summary

The FMA must be able to assess implications under supervisory law observed for the digital technologies that to date have only been used scarcely or only used in a few sectors (comparison portals, social media, chat bots).

Three rough technological groups have been able to be deduced from the results of the survey:

- **Established means of communication** (e.g. websites, telephony, e-mail, apps for mobile devices) already being used by a broad majority of the supervised entities.
- **Growth groups** (e.g. social media, comparison portals) have already achieved a certain degree of prevalence in the financial market, with more and more of those asked planning to use them in the future. It therefore appears that such channel of communications will soon be considered as standard.
- **Marginal groups** (e.g. live chat, video conferences, chat bots) are barely used, or are only used in a few sectors. Some undertakings are planning to introduce such technologies, and they will therefore within the foreseeable future play a more significant role.

Digital transformation requires a stable foundation and legal clarity

- A lack of legal clarity regarding its classification under supervisory law and the possibilities of practical implementation especially with regard to
 - The question of approval requirements within the electronic conclusion of contracts and electronic communication,
 - The possibility of doing without advice, without the need to request this,
 - The evaluation of opportunities for influencing the ordering in a comparison portal (e.g. with regard to potential conflicts of interest),
 - The evaluation of which technologies satisfy the requirements for a durable medium or which requirements can be placed on fully or partially automated advice systems and advice algorithms.

The FMA should therefore work in these areas towards ensuring greater legal clarity and where applicable communicate its positions or expectations in order to minimise legal risks as far as possible and to create a level playing field.

¹⁵Art. 132 para. 2 VAG

E. Consultation on Distribution

What duties should the FMA perform with regard to the protection of investors, insured persons and creditors in relation to the digitalisation of the interfaces to the customers?

In which form should such tasks be undertaken?

What specific regulatory standards are still necessary due to the digitalisation of the financial sector?

Do data protection rules in particular need to be adapted or further refined?

From your perspective, do impediments exist in Austria that hinder digital communications?

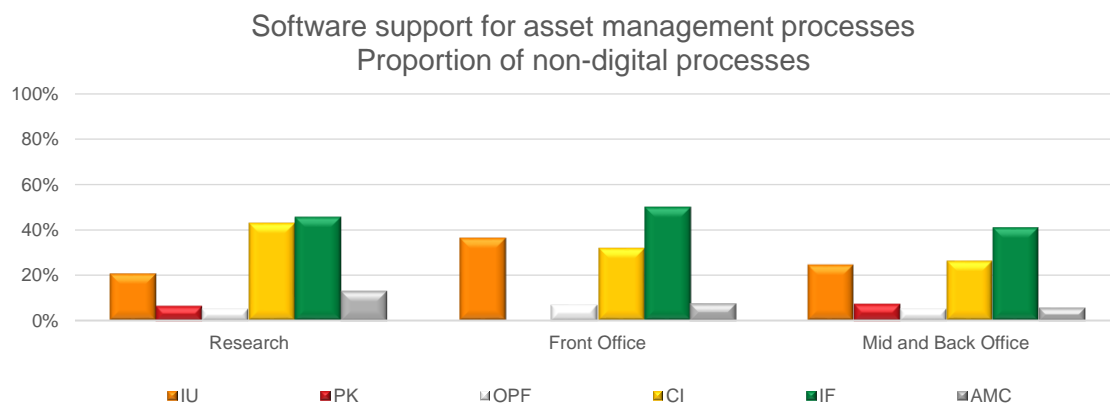
What specific positive as well as negative developments regarding “digital” distribution can be observed from your perspective?

V. ASSET MANAGEMENT

Digital information technologies have already penetrated into asset management for a long time. Digitalisation in asset management relates both to the IT systems of market participants as well as the financial instruments e.g. in the form of new forms of investments or new investment classes. To evaluate how the information technologies are taken into account in supervision and regulation of supervised entities, their deployment was investigated based on the individual steps in the investment process.

A. IT systems in Asset Management

IT systems are deployed in practical all processes in asset management. Therefore in the following figures comparing the different sectors, in each case the proportion of non-digital processes are shown. The different shares of non-digital processes in the individual sectors is affected to a certain extent by the sector-specific differences in business models.



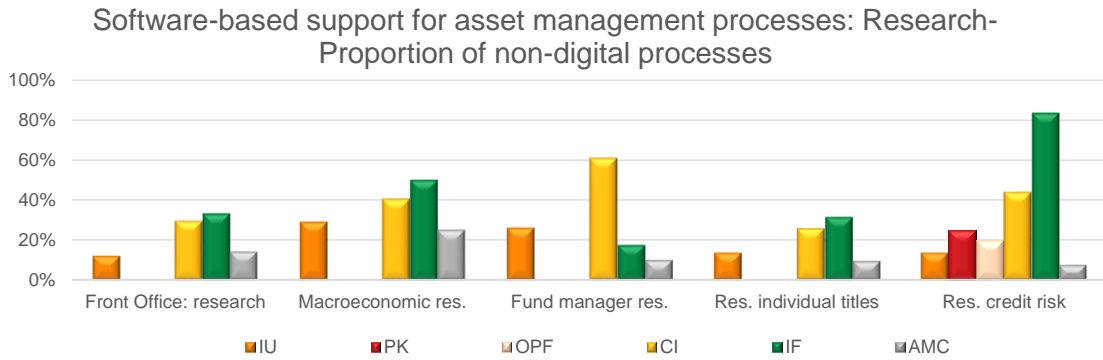
In particular the size of the company, the resources deployed, as well as the degree of centralisation of investment are relevant for the level of digitalisation in asset management processes. Regulatory requirements also play a role.

- While 44% of **insurance companies** with group-wide centralised asset management deploy more IT systems, in the case of 50% of IUs with outsourced asset management the opposite is the case. The median of assets under management of IUs with centralised group-wide asset management currently is more than Euro 4.5 billion, compared with only around Euro 200 million for those that don't.
- In the case of **Pensionskassen** organisation also plays a large role: one half of all PKs have either fully or partially outsources investment and more than 95% of the total market assets are invested in funds: the IT connection to the outsourcing partner or the use of IT systems in the due diligence of funds is therefore particularly relevant. Online customer portals of MCs or the customs or automated data transfer between SFTP servers are used for this purpose.
- 5 out of 6 **occupational provision funds** perform almost all asset management activities using IT systems, with other parts also planned to be conducted in this way.
- The surveyed **asset management companies** by and large use IT systems in relation to asset management activities. The deployment of further IT systems is planned.
- Only a small minority of **banks** have replaced all purely manual steps, and in a few areas only a few CIs have deployed a suitable software solution. 35% of CIs use external service providers for (sub) processes. These processes are diverse in nature and range from order execution, pricing, classification of securities, settlement of securities transactions through to the custody of securities.

The deployment of digital processes can also be broken down into the following procedural steps:

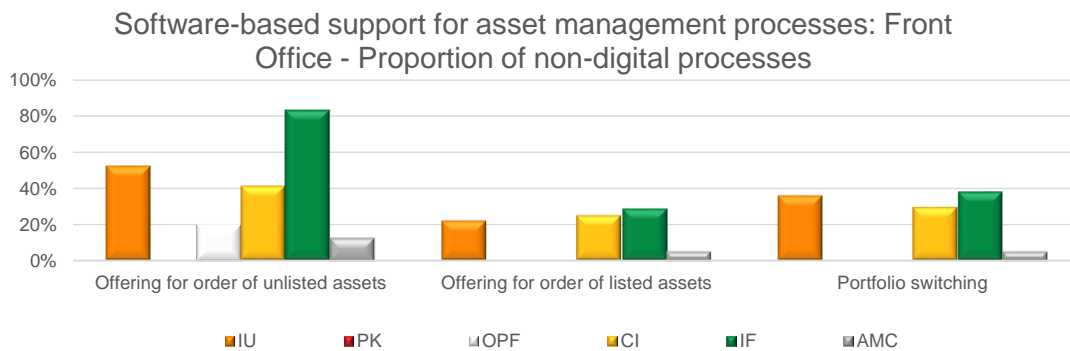
1. Research

Prior to every investment decision a comprehensive data analysis is performed, e.g. regarding the selection of external managers or investments in individual titles. There is also a large wealth of information to be evaluated in relation to ongoing due diligence (e.g. key balance sheet data, performance), documented and monitored.



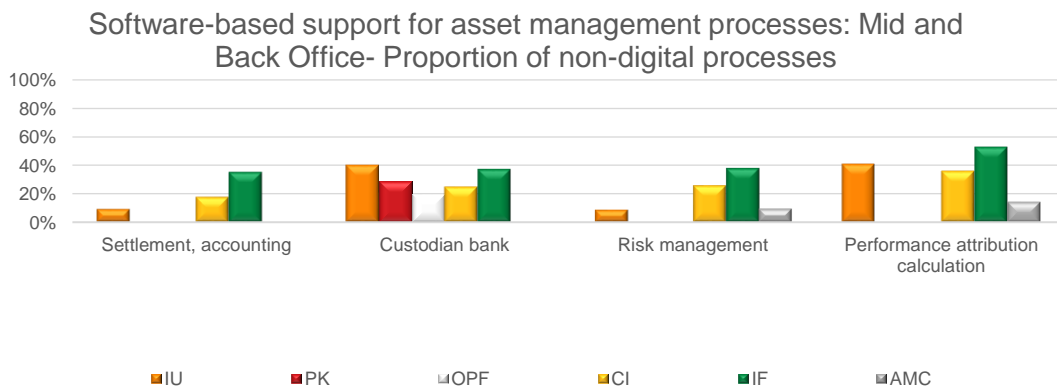
2. Front Office

Following research conducted in relation to due diligence, the implementation of investment decisions takes place in portfolio management, with it being possible to differentiate between different procedural steps in relation to the use of IT systems:

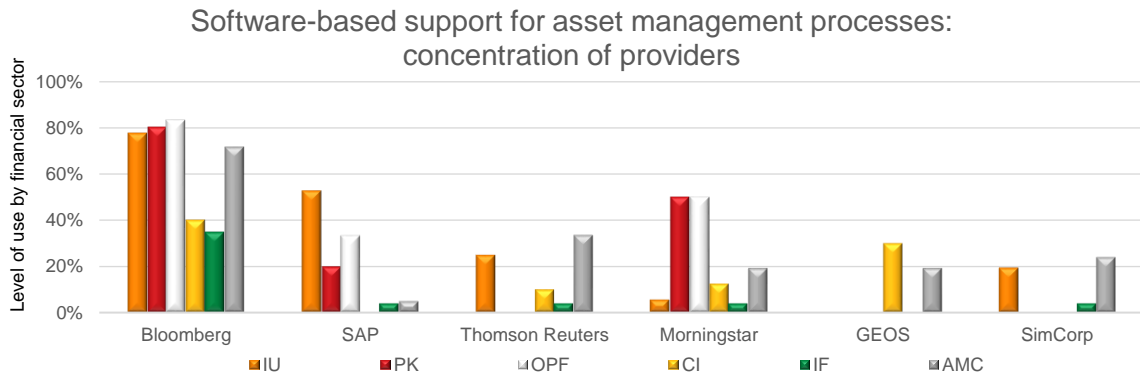


3. Mid / Back Office

Once the investment decision has taken place and the order made, the securities orders are duly executed and books or the documentation in relation to unlisted assets stored accordingly. The mid and back office functions also include the interface to the custodian bank, ongoing risk management and performance attribution analysis.



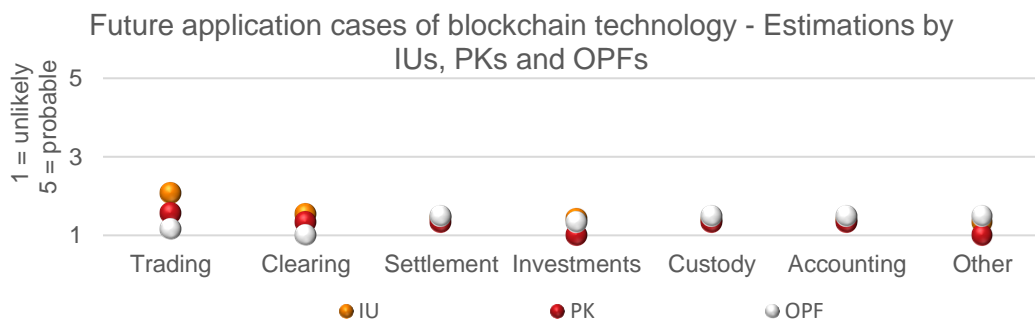
The following information and portfolio management systems are the mostly widely used ones in asset management: Bloomberg, SAP, Thomson Reuters, Morningstar, GEOS (SDS) and SimCorp:



B. Blockchain technology

In light of the new developments in the field of new forms of investment and taking into consideration influencing factors such as increasing cost pressure, the low interest environment and the search for investments, the issue therefore arises to what extent new forms of investment may be used.

Austrian institutional investors are as a rule cautious in relation to the deployment of Blockchain-based technology. The most likely application of Blockchain technology is in relation to trading:



- Insurance companies consider the use of blockchain technology as most probable in the next three years in the trading in investments in the form of investment tokens.
- Pensionskassen are more reserved in this regard: only one Pensionskasse has considered the use of blockchain technology as relatively probable in the next three years in connection with investment.
- Blockchain technology is currently not actively used in occupational provision funds. However, one OPF is currently evaluating its use.
- Only one of the surveyed banks is planning to use blockchain technology in relation to trading, clearing, settlement, booking and custody in the next three years. The use of blockchain technology might on the one hand lead to a simplification and the quicker performance of processes, and furthermore on the other hand may ensure traceability. Eight of the surveyed CIs see possibility for linking DLT (Distributed Ledger Technology) with KYC regulations.
- One asset management company actively uses a blockchain solution for processing information.

There are differing views on the potential areas of application about new investment forms, with consensus existing among supervised entities in classifying blockchain technology as not being particularly significant in the near future for their business.

- ❑ Supervised entities are also very cautious with regard to other new forms of investment, such as primarily retail-oriented investment forms and virtual currencies:
- ❑ No undertaking is planning to invest in crypto-assets in the next twelve months and other new investment forms have been used to date.
- ❑ The only use of new investment forms are participations in InsurTechs by IUs.

C. Summary and Action Areas for the FMA

In an environment of high IT penetration automation processes are gaining in significance

- ❑ Generally among the supervised entities in the asset management sector there is a strong penetration of IT systems. This is particularly strongly prevalent in the case of management companies, Pensionskassen and occupational provision funds.
- ❑ Software-based automation processes are still increasingly gaining in terms of significance. Regarding cost pressure for asset managers, process automation by means of Robotic Process Automation (RPA) is also becoming ever more attractive for asset management companies.
- ❑ The greatest potential in efficiency terms for RPAs are in mid and back office areas.¹⁶

Monitoring the Expansion of Alternative Technologies

It is not possible to detect a strong trend regarding the expansion of alternative technologies, such as AI, Deep Learning and Machine Learning. Such results do not mean that new technologies do not play any role in asset management. However, it is far more the case that special software applications have already always been used in various quantitative management methodologies and strategies.

Manual manipulation of data constitutes a potential source of errors. Therefore the level of digitalisation should also be included in the evaluation of the observance of the prudent person principle in investment.

- ❑ How the IT systems deployed in asset management are fixed within the company's internal IT landscape, and whether or by whom a review is conducted prior to the execution of an order, is also significance in relation to the internal investment limits.
- ❑ Electronic data capture is as a rule also a condition of the capturing of assets in the risk management.

The financial market data information systems deployed and the interfaces both externally and internally within the undertakings in some sectors are as rule also decisive with regard to the correct calculation of own funds requirements.

- ❑ The interfaces to the external fund managers and the submission of the funds portfolio are a pre-requisite for the correct calculation of the own funds requirement.
- ❑ A main problem in relation to the valuation of the assets are exchange-listed but nevertheless not particularly liquid investments in bonds. Although the market value identified in financial market data systems does not necessarily reflect the actual realisable disposal value, alternative valuation methods to a large extent are also based on market data (e.g. interest rates and interest rate curves, implied volatilities).

¹⁶ According to estimations, asset management companies are able in some areas to save up to 75 % in costs in this way. The implementation of RPA pilots in asset management companies has however also shown that the complexity of the processes that are to be automated is partially under-estimated, and that RPA programming knowledge is often not adequate and the frameworks for the deployment of RPAs are often not taken into account enough. See, for example (in German only) <https://www.pwc.de/de/finanzdienstleistungen/digital/wie-asset-manager-durch-robotic-process-automation-ihre-ertraege-steigern-koennen.html>, accessed on 22.11.2018.

- Therefore, and in light of the fact that the asset valuation directly influences the solvency situation and since bonds are the most important asset class in a few sectors, the financial market data information systems are particularly important¹⁷. The following issues should be considered in the inspections by the supervisory authority.
 - What financial market data information systems are used?
 - How are the software licences designed?
 - How and in which IT systems are alternative valuation methods deployed? For which asset classes?
 - What adjustments are made “manually” to market data in the valuation for the solvency balance?
 - How are the interfaces with external service providers designed?

Monitoring of investments in new investment forms

- One of the most significant issues for new investment forms, is their allocation in the balance sheet in terms of their classification as assets. The high volatility of virtual currencies and in certain circumstances their prompt settlement provide circumstantial evidence for being allocated as short-term assets.
- In relation to investment in blockchain issuances clarity should be obtained to what extent such issuances fulfil requirements in relation to their location.
- With regard to the frequently indirect form of investment in investment funds it must be clarified whether and how institutional investors invest in funds with new investment forms and which investment processes and risk management requirements are applied for this purpose.
- Since the valuations of growth companies are often priced in accordance with the high growth rates, the selected valuation approaches for FinTech start-ups may be applied as an element for the valuation of the investment with regard to the prudent person principle.

D. Consultation on Asset Management

From your perspective, what duties should the FMA perform with regard to digitalisation in asset management?

What specific regulatory standards are still necessary due to the digitalisation of the financial sector?

What impediments exist in Austria for automating asset management processes and to simplify the expansion of alternative technologies such as AI, deep learning and machine learning?

What specific positive as well as negative developments regarding the digitalisation of investment can be observed?

¹⁷ Article 10 of the Level 2 Regulation (EU) 2015/35, in 2017 more than a quarter of all IU assets were valued using alternative valuation methods.

VI. ACCOUNTING

Digitalisation also has effects on accountancy and accounting. This in particular relates to future accounting frameworks and financial reporting, the depiction of digital innovations (e.g. Cryptocurrencies) in accounting and the audit engagements.

A. Implications of Digitalisation

Automation in accounting alters the benchmark for Fit & Proper

- In supervised entities, groundwork is currently being performed such as the automation of processing of incoming invoices. With increasing digitalisation processes and systems in accounting are currently being overhauled towards paperless accounting. Interfaces to external systems are simultaneously gaining in significance.
- Aside from making use of robotic process automation at global level initial attempts are being made regarding the use of artificial intelligence in accounting. In January 2017 for example a Japanese insurer (Fukoku Mutual Life Insurance) replaced 34 office employees with Watson¹⁸. Watson replaces routine work such as scanning documents and data, and the programme also checks the names and data about the insured persons as well as their previous medical history and assesses injuries, makes proposals about the amounts to be paid out, which are then checked by a human prior to being paid out.

Data quality may be increased by increasing automation.

- Automation also impacts job profiles and therefore also affects the requirements regarding expert qualification. This relates both to the persons performing accounting activities as well as statutory auditors. Closer cooperation with data and analysis experts may demands that skills in the field of business administration and law are extended by competences in the areas of mathematics, technology and information technology.

Electronic reporting opens up new possibilities for analysis

- From 2021 in accordance with the Transparency Directive annual financial reports should be published in XHTML format, and in the case of consolidated financial statements under IFRS the majority of the data should also be prepared in machine readable XBRL format. These extended possibilities for analysis for the interested public should contribute to greater transparency and comparability.

IT audits are becoming more significant in audit engagements

- Auditing of IT-assisted systems is part of the subject matter of the audit engagement, provided that such systems are of relevance for accounting. Due to the increasing automation of accounting processes in supervised entities IT audits by statutory auditors are also becoming more frequent and more complex.

Digital Audit does not ensure complete audit reliability

- Digitalised audit engagements also do not ensure complete audit reliability and unlike in the case of the audit opinion (and any other form of positive assurance) neither offer an opinion with adequate certainty, since neither room for discretion nor scope for evaluations are able to be reviewed, and therefore there is also no complete audit reliability.

¹⁸ See also (in German) <https://www.deutschlandfunknova.de/beitrag/versicherung-in-japan-statt-angestellten-rechnen>.

B. Consultation on Accounting

What duties should the FMA perform with regard to digitalisation in accounting? In which form should such tasks be undertaken?

What specific regulatory standards are still necessary due to the digitalisation of the financial sector?

What impediments exist in Austria for automating accounting processes and to simplify the expansion of alternative technologies such as AI, deep learning and machine learning?

What specific positive as well as negative developments regarding the digitalisation of accounting can be observed?

VII. IT INFRASTRUCTURE

A. IT systems in use

To date the IT systems used in the Austrian financial market have clearly been designed as tools for administration of and assistance in core processes. The following trends have emerged:

There is a high level of diversity of systems across the market, as well as also within groups and within undertakings.

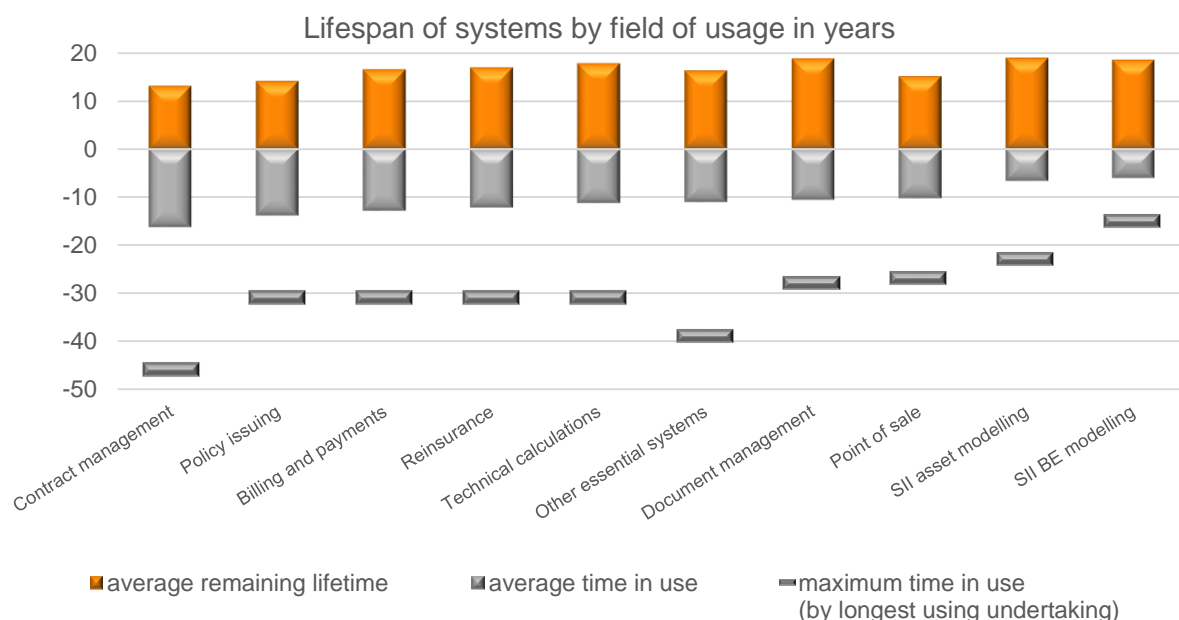
- Both proprietary software developments, as well as off-the-shelf solutions e.g. products by Bloomberg and SAP, are used.

By deploying solutions from the large providers the software landscape for covering standard processes overall is becoming more harmonised.

- Products by external providers are often able to cover several relevant areas within the undertaking and come with pre-defined data interfaces.
- The potential loss of flexibility is often accepted by using non-company-specific applications. This trend is also being demonstrated by the increased deployment of cloud services (see also the Annex).

In some cases, however, relatively old systems are still in use, that are slowly also reaching the end of their intended life cycle.

- This sometimes requires relatively **complex software projects** to replace them. The IT systems of insurance companies are one such example for such a development. On average that have already been in used for ten years, although this figure varies somewhat depending on the area in which they are used. On average their usage is planned for another 10-20 years.

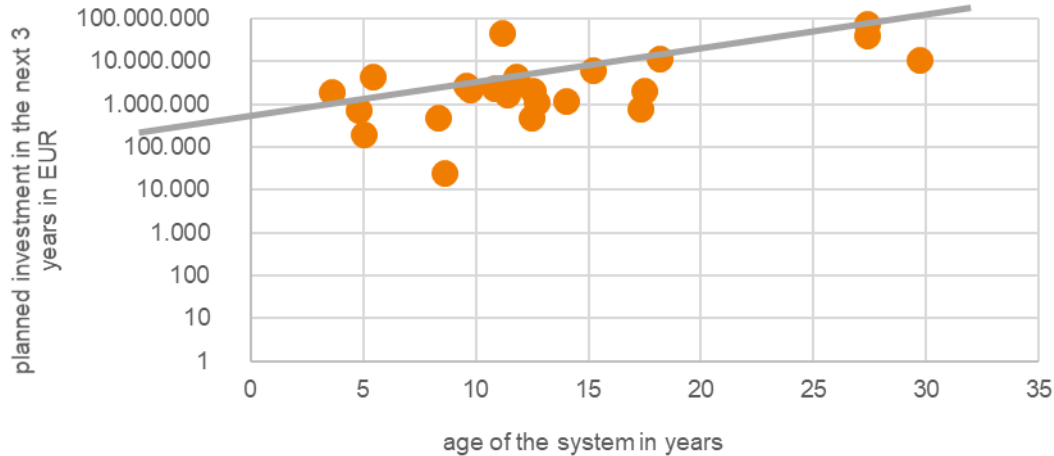


Old IT systems may be particularly susceptible with regard to cyber risks.

- Older systems with a shorter expected remaining lifetime are more likely to be found in core business lines.
- Especially in this area, their replacement with a new solution is relatively cost-intensive and risky.

This costs of maintenance, further development and potential replacement of a system increase steeply as the previous duration of use increases:

Duration of use to investment costs



Due to the need to renew or consolidate, a few undertakings have a high need for investment.

- Austrian undertakings will invest heavily in their IT landscapes in the coming years. The FMA has only collected detailed figures for the insurance sector, but a similar development is also to be expected for the other sectors in the financial market.

B. Deployment of new IT Systems

At the same time many market participants are investment in the deployment of new technologies. Their principle motivation in doing so is above all to increase efficiency by means of automation. In order to realise this goal, several tools are available for this purpose:

- The deployment of **more complex technologies** often requires a lot of know-how and investment, particularly when such technologies are not very widespread and therefore where there is less available experience. However, to a certain degree they are very flexible in terms of their application and may also be used for the automation of complex tasks.
- At the other end of the scale there are **simpler solutions**, which may only be able to perform very simple processes, but which are deployable relatively quickly, and the implementation of which is associated with less risk, as well as spreading quickly.

The outstanding overhauling and replacement of core systems account for the largest proportion of planned IT projects, followed by consolidations and modernisations, and last of all automations as well as the deployment of modern digitalisation technologies.

While projects are also conduct for overhauling of systems, there is nevertheless a distinct priority towards the replacement of obsolete legacy solutions. Such a development is proven by the figures relating to the proportion of insurance companies, in which large projects are either plans or currently under way in the respective categories.

- 35% Replacement of core systems
- 26% Distribution platform
- 22% Consolidation of existing systems
- 18% Updating of / overhauling of existing systems
- 13% Automation / black box processing as well as 13% digitalisation

The replacement of core systems is the most complex scenario for an undertaking, especially when it is intended to be achieved in a single large project. Usually this is only done, where

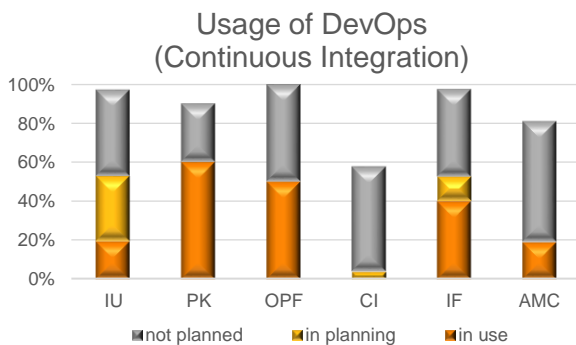
- massive cost pressure prevails and the changing of the platform promises to bring harmonisation or increased efficiency,
- the system is no longer able to cover new requirements,
- the system is a proprietary development and the capacity for further development in-house no longer exists.

In the case of ongoing IT projects in a few sectors a trend is emerging for departing from the traditional management methods (e.g. the waterfall model) towards so-called “agile” approaches (e.g. SCRUM).

The principle feature of such methods is that no fixed project schedule and no milestones are defined, but instead the aims and specifications of the project are able to be adapted constantly as part of a dynamic process.



In the case of Scrum the outstanding work packages (product backlog) are specifically broken down into smaller chunks (sprint backlog), which are worked through within an individual non-interruptible working cycle with a pre-defined duration (sprint). Before a further sprint begins, the remaining outstanding work packages made be adapted at any time and reprioritised accordingly.



Agile procedures in IT are already an important issue especially among PKs (in use in 60% of PKs) and OPFs (in use in 43%).

In the case of IUs and CIs usage is currently increasing, with over 50% of the respective undertakings to have adopted this concept within the next three years.

That continuous integration is only now becoming commonplace among financial services providers may hint at the fact that IT is transforming from a purely support department into becoming a core element of the undertaking, that may also act as an organisational driver.

There are a few advantages and disadvantages in comparison to traditional project management:

<i>Advantages</i>	<ul style="list-style-type: none"> ■ Increased flexibility for handling changes in requirements ■ High degree of transparency in relation to ongoing progress which may prevent against overrunning both in terms of budget and time ■ Focus on operable product versions reduces the technological risk
<i>Disadvantages</i>	<ul style="list-style-type: none"> ■ The coordination of several groups of developers that are dependent on one another is particularly challenging under an agile approach. ■ Many established tools and key figures in company structures (e.g. cost estimates, milestones) are not included in agile methods, which may impede integration in an undertaking. ■ Disregard for documentation

Projects which in some cases are very extensive that have commensurately high costs and time pressure attached lead to an increased operational risk.

Migration of the implementation process at the same time to agile approaches, of which there is only limited experience available in many undertakings, may further increase the risk.

C. Consultation in relation to the deployment of IT systems

What duties should the FMA perform in relation to the IT systems used in the Austrian financial market? In which form should such tasks be undertaken?

What specific regulatory standards are necessary in relation to the use of IT systems in the financial sector?

What positive and negative aspects exist for IT security in relation to the increasing concentration of the financial market towards only a small number of IT providers?

Are the material advantages and potential disadvantages of agile approaches duly captured?

What specific positive as well as negative developments regarding IT systems in individual sectors can be observed?

VIII. CYBER RISKS

Increasing digital networking increase the general vulnerability towards cyber risks. The financial services sector constitutes the most attractive and most strongly addressed sector for cyber attackers.¹⁹

The Center for Strategic and International Studies (CSIS) and McAfee²⁰ estimate in a study from 2018 that almost \$ 600 billion, i.e. almost one percent of global economic output (GDP) is lost year-on-year to cyber crime. In the previous study conducted in 2014, the global losses were estimated at around \$ 445 billion. It is estimated that 26% of all cyber attacks worldwide affect undertakings in the financial sector.

Austria is also not able to escape from the threat of cyber risks in an internationally networked world. As can be read in the Republic of Austria's "Bericht Cyber Sicherheit 2018" (Cyber Security Report 2018), the threats are increasing, with attacks becoming significantly more frequent and more complex.

A. Definition of Cyber Risks

Cyber risk is generally considered both among the supervised entities as well as from the FMA's perspective as a component of IT risk, which in turn is subsumed in operational risk. The specific internal definitions nevertheless show an inhomogeneous picture. While CIs in their definitions do not on the whole stick to standardised definitions, IUs on the other hand show a tendency towards aligning themselves towards the IAIS definition.²¹

Despite various attempts to harmonise definitions on cyber risk topics across different sectors, this aim has not yet been implemented in practice. For example, the Financial Stability Board (FSB) published its Cyber Lexicon in November 2018 containing terminology related to cyber risk: it defines Cyber Risk as: "The combination of the probability of cyber incidents occurring and their impact."²²

Due to a lack of a harmonised definition of cyber risk the comparability of the results both within the individual sectors as well as between them is very limited and therefore makes it more difficult to assess cyber-resilience.

Inconsistent definitions especially restrict comparability of the following areas:

- **Number of cyber events**, since for example spam e-mails, port scans, access attempts blocked by the firewall and similar potential but not clear threats are counted by some undertakings as an event, but not by others;
- **Cost estimates**, as a number of types of damage may be caused by a cyber attack, such as e.g.:
 - loss of profits, lost working time as well as legal consequences that arise from services not being available,
 - internal and external personnel costs for recovery measures,
 - Hardware that is physically damaged or disposed of for security reasons,
 - Loss of reputation, loss of data, etc.

¹⁹ See e.g. Accenture, [2017 cost of crime study – insights on the security investments that make a difference](#) or IBM Security, [X-Force Threat Intelligence Index 2019](#).

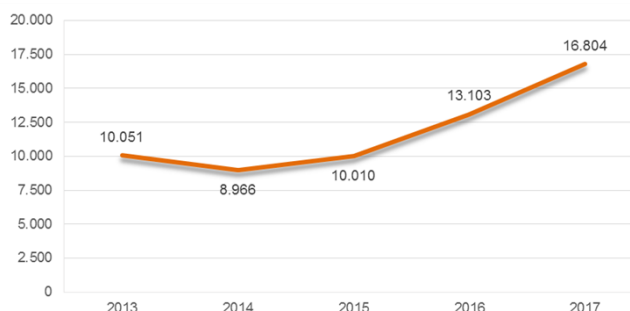
²⁰ CSIS and McAfee, [Economic Impact of Cybercrime – No Slowing down \(2018\)](#).

²¹ IAIS (2016) [Issues Paper on Cyber Risk to the Insurance Sector](#)

²² FSB, [Cyber Lexicon](#).

B. Cyber attacks on supervised entities

The general trend is that cyber attacks have increased on a continuing basis in recent years, both in terms of their frequency as well as their complexity. The number of criminal complaints in relation to cybercrime has also increased in Austria since 2014.²³



The financial sector is particularly affected by such developments. This is

in particular due to the “inherent monetary nature” of the financial services sector, as well as due to the increasing global level of interconnectedness. Successful cyber attacks may proliferate quickly, and may therefore become a danger for financial market stability.

To date, mainly banks were the target of cyber attacks within the financial services sector. Details about the number of attacks vary massively between the various sectors.

- While in some sectors there were only a few attacks per year in some sectors, the numbers of attacks in other sectors range into the millions. Overall the number of successful attacks in relation to the number of registered cyber attacks is low.
- It is not possible to prove a precise breakdown of the individual types of cyber attacks, since interconnections exist between the individual attacks. For example ransomware is a type of malware. The risks associated with ransomware are diverse, and cover information leakage, malware, phishing, spam, web application attacks, web-based attacks and denial of service (DoS).²⁴

The number of successful attacks on entities supervised by the FMA have fallen recently; however the associated costs of such attacks have not. This implies that there has been a “professionalisation” of attackers.

- While successful attacks on supervised entities in 2017 fell overall in comparison to the year before, the associated costs increased, which is why an increasing level of “sophistication” of the attacks may be assumed.

The cyber attacks observed that have taken place in Austrian entities supervised by the FMA are in line with the trend throughout Europe.

- The ranking of “Top Threats 2017” produced by the European Union Agency for Cybersecurity (ENISA) is headed by malware, with phishing (4th place), spam (5th place) and ransomware (7th place) all featuring in the top 7.²⁵
- While phishing and malware are stated in 2017 as the most significant types of cyber attacks in supervised CIs in Austria in 2017, ransomware occupies the top spot among IUs.
- A sample of the attacks that signify the most acute threat in the Austrian financial market, are as follows:

²³ Bundeskriminalamt, [Lagebericht Cybercrime 2017](#), 11.

²⁴ C.f. e.g. European Union Agency for Cybersecurity (ENISA), [Top 15 cyber threats in 2017](#).

²⁵ ENISA, [ENISA threat Landscape Report 2017, 15 Top Cyber-Threats and Trends](#). See also: ENISA, [ENISA Threat Landscape Report 2018, 15 Top Cyberthreats and Trends](#).

<p>■ Ransomware attacks:</p> <p>Encrypting of company data Without a key the data is irretrievably lost</p> <p>They frequently quickly spread throughout the undertaking's entire system</p> <p>As the example of NotPetya has shown, as well as the previous attacks like Petya and WannaCry, immense damage can be caused</p>	<p>■ Countermeasures:</p> <p>Backup concept to ensure that data is backed up frequently, completely and securely</p> <p>Prompt software updates: often systems are infected where known weaknesses have not been closed quickly enough.</p>
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<p>■ Phishing/social engineering:</p> <p>Sometimes in the form of a direct attack (CEO fraud)</p> <p>Also often via phishing websites and malicious e-mail attachments with the objective of malware being installed</p> <p>May affect the undertaking itself directly, as well as its customers.</p>	<p>■ Countermeasures:</p> <p>Awareness measures both for staff members as well as, where applicable, for customers</p> <p>Current spam filters and firewall configurations</p>
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<p>■ DoS/website manipulation:</p> <p>May lead to a business interruption and to online service failure</p> <p>A very easy attack to pull off due to bot networks that can be hired</p>	<p>■ Countermeasures:</p> <p>Contingency and communications plans</p> <p>Close cooperation with the hosting provider</p>
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From the responses received from all of the financial sectors asked, the threat is more from generally proliferated cyberattacks rather than ones that specifically target individual undertakings.

Threat scenarios such as the targeted theft of data and cyber terrorism have hitherto not been realised among Austrian institutions. Ransomware in particular is frequently stated as a principal mechanism for losses, although the infection with malware often occurs via contaminated phishing e-mails.

Rankings about cyberattacks in banks and insurance companies

Banks

The three most frequent types of attacks:

- Phishing
- Malware
- Spamming

The top 2 most severe types of attacks in terms of costs:

- Phishing
- Malware

Insurance Companies

During the last four years, ransomware has by far and away been the most cost-intensive type of cyberattack. Business interruptions as well as material costs for third parties were in particular the effects of such attacks.

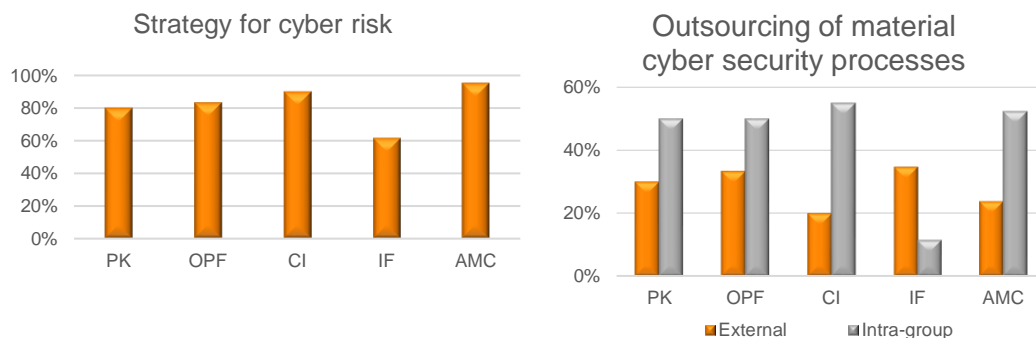
The situation with regard to other top cyber risks, which include the defacing of websites, their manipulation to distribute malware as well as malware infections, as well as phishing, is not consistent, with the number of cases being low compared to ransomware.

C. Management of cyber risks

1. Cyber risk strategy

The overwhelming majority of supervised entities have an explicit strategy for dealing with cyber risks.

Such strategies, which may also be part of the IT strategy, are intended to comprehensively and effectively ensure the identification of as well as the management and minimisation of cyber risks.

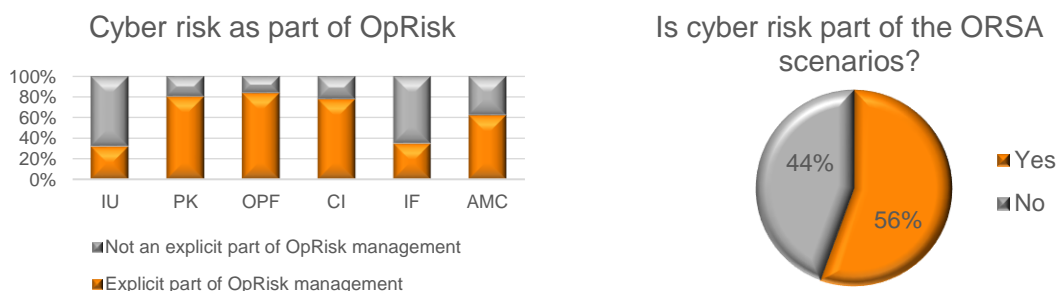


The outsourcing of material processes in relation to cybersecurity is widespread.

- The outsourcing of material processes to ensure cybersecurity is conducted by 20% of banks to external providers and by 55% to companies within the same group. The proportion of intragroup outsourcings is therefore the highest among the financial sectors.
- 83% of the occupational provision funds, 65% of the asset management companies, 50% of Pensionskassen and 46% of investment service providers have outsourced material processes either within their group or to external service providers.

2. Governance in relation to cyber risks

Around 80% of banks, Pensionskassen and OPFs explicitly address cyber risk in their operational risk management framework.



In contrast only 60% of asset management companies and one third of Insurance and investment service providers formally explicitly include cyber risk in their operational risk management framework.

In the insurance sector the apparent need to catch-up in handling cyber risks in operational risk management is relativised by every second entity by including these risks in the Own Risk and Solvency Assessment (ORSA).

3. Measures for Detection, Prevention and Defence

In addition to the implementation of processes for the identification of entity-specific potential threats by cyber attacks various other risk management measures are also deployed.

Most supervised entities have an overview about the most significant component parts of their network infrastructure and an inventory of all critical applications and the associated IT infrastructure as well as interfaces with third parties.

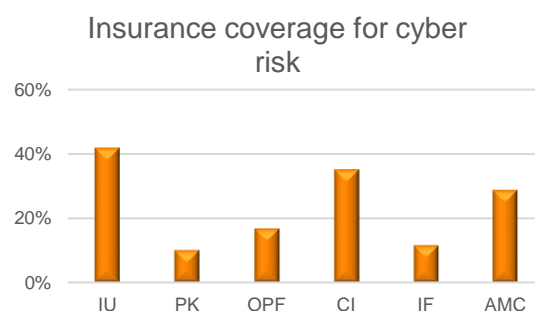
- The availability of a current and comprehensive overview about the information network forms a basis for the prevention of cyber attacks. It can be used to evaluate the respective vulnerability in relation to cyber risks more simply and thereafter the assignment of priorities from be derived from it.
- Processes for detecting and logging of attacks are generally implemented.
- Where systematic electronic logs are not yet fully held for the detection of cyber attacks, such an implementation is nevertheless generally planned.

Various additional measures, such as recourse to results from collected loss data, will be used to stave off cyberattacks in the future, e.g.

- supervised entities refer back to self-assessments as well as collected loss data to identify cyber risks.
- Scenario analyses and stress tests are used for assessing risks.
- Protective measures regarding the technological infrastructure against cyber attacks have been taken: i.a. The unauthorised misappropriation of data is prevented by monitoring the transfer of data, an explicit monitoring and protection of network infrastructure as well as the interfaces to external networks (above all to the Internet) is guaranteed, and the network is separated or segmented into different confidentiality zones.
- The necessity of sensitising staff members regarding cyber risks is both recognised and duly implemented.
- Data backup concepts have been drawn up and tested.
- A large number of supervised entities conduct security assessments, which are primarily conducted by external providers.
- IT-specific contingency plans for allow the prompt return to normal business operations following cyber attacks exist.

Around one third of insurance companies, banks and asset management companies insure themselves against the costs arising from cyber attacks.

- 19% of insurance companies hold several and a further 22% hold one insurance contract for covering their own cyber risk.
- 35% of banks have concluded insurance contracts to secure themselves against the costs arising from cyber attacks. 45% are planning to do so within the next three years.
- 8% of investment service providers have coverage for their cyber risk.
- One occupational provision fund holds insurance against losses incurred from cyber attacks. Another is planning to take out such insurance. Among the Pensionskassen, currently one undertaking is insured in this way.



D. Summary and Action Areas for the FMA

Supervised entities in the Austrian financial market are taking the issue of cyber risks seriously. They are developing strategies and are taking cyber risks into account in their risk management. With regard to the frequency and type of attacks that they are exposed to, particular vigilance continues to be required in this matter. Cyber risks also remain an issue of permanent importance for the supervisor:

Protection against cyberattacks is a strategic issue

In 2018 the FMA rolled out **Guides on the topic of IT and Cyber Risks** across the entire Austrian financial market, which primarily focus on the governance of undertakings. A central tenet is that cyber risks must be a management issue and must be approached on the strategic level. The FMA will specifically check whether the Guides have been adequately implemented in the undertakings.

E. Consultation on Cyber Risks

Using which measures or initiatives might be FMA be specifically able to contribute to increasing cyber security in the financial market?

What specific regulatory standards are still necessary in relation to IT security in the financial market?

Which cyber threat scenarios may be particularly relevant for the Austrian financial market in the future?

Which core areas of IT security should be strengthened by undertakings in the Austrian financial markets as a priority?

Should further measures be deployed by undertakings to defend against cyber attacks in the future?

From your perspective is there a balanced level of threats between the different sectors of the financial market, or are some areas particularly highly exposed?

What specific positive as well as negative developments are observable with regard to cyber attacks?

What lack of legal clarity, opportunities and threats do you see in relation to cyber insurance?

IX. Annex: DIGITAL TECHNOLOGIES

Rapid technological advancement also doesn't not stop for financial market participants. New technologies may make business processes more efficient, allow the interface to the customer to be designed in a more user-friendly way and allow new products or business areas to be created.

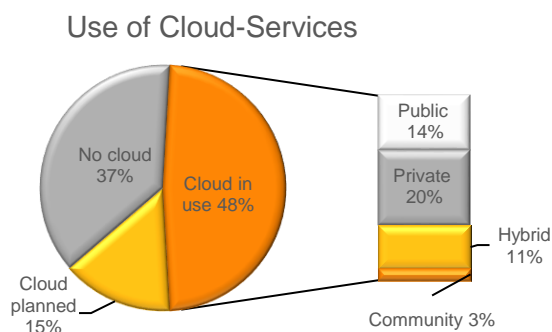
The most significant technologies that are also spreading to the financial markets include:

A. Cloud Services

Cloud Computing means making IT infrastructure and IT services as well as storage space, processing power or software applications available over the Internet. Cloud solutions and resources are not made available from a specific computer. Instead the virtual processing cloud comprises of many computers that are networked to one another. Users of a cloud service access the pool of resources in the cloud through a network (Internet or Intranet). Cloud services differentiate from traditional outsourcings to data centres in a few significant ways²⁶:

Service On-Demand	The customer automatically receives the resources that he/she requires from the cloud (storage space, processor power, software). This takes place automatically, and no interaction is necessary with the cloud provider.
Access over the Internet	The cloud can be reached using standardised communications protocols over the Internet.
Resource pools	The cloud's resources are distributed to the users irrespective of their location. As a rule they have no knowledge of and do not check the actual physical location of data and computers.
Dynamic scalability	The resources made available to the user can be dynamically scaled as required. In most cases they appear to be unlimited for the individual users of the cloud.
Measurable performance criteria	Cloud systems measure the resources that are actually consumed on the basis of appropriate metrics and there ensure transparency as well as a clearly defined basis for calculating costs.

The practical significance of cloud services is also increasing in Austria: around half of the undertakings in the financial sector are using clouds, and this level will increase to almost two-thirds by 2021.



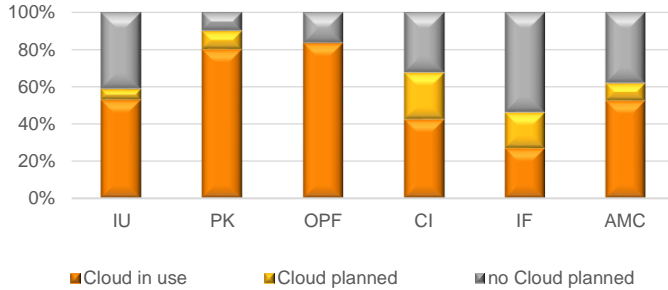
Cloud services are already being used by almost half of the supervised entities. A further 15% of undertakings want to use cloud infrastructures in the next three years.

Some undertakings also use several cloud solutions, which generally fulfil different functionalities in undertakings.

²⁶ Cf. also e.g. [The NIST definition of Cloud computing 2011](#).

The users represent the full range of sectors, with the Pensionskassen sector and the occupational provision funds in particularly making very substantial use of cloud services.

Usage of Cloud services by sector



The nature and scope of the services used through the cloud varies strongly, and differs in accordance with several criteria.

Opportunities

- Cloud outsourcing may reduce the procurement, set-up and usage costs for an undertakings internal IT infrastructure. When operational, as a rule only the actually used capacity is paid for.
- Work is possible practically irrespective of location and collaboration is improved in widely dispersed organisational structures.
- Deployment of new systems can take place at short notice
- Automatic load balancing across a lot of components make cloud structures more resilient against failures
- Large, group-wide data pools can be created and used for purposes like big data analytics.

Threats

- It is often not clear for users whereabouts in the cloud data are processed. Necessary deletion of data - as also required by law - may only be possibly in an inadequate or incomplete way.
- The usage of the cloud however also increases the complexity of an IT landscape and makes a more complex IT security management necessary.
- It is not always clear for users in which countries, data centres, on which services and using which software data is stored and processed. The data flows are also unknown.
- There is no physical separation of data for different customers in a public cloud due to the use of virtualisation and grid computing. Third parties might be able to obtain unauthorised access to data and to manipulate it.
- Checks in relation to the processing of data may often only be conducted by the provider and not be the responsible user.

B. Blockchain

A blockchain is a cryptographically coded database (ledger) with a digital log that cannot be manipulated stores on a large number of decentralised computers. All different types of information (bookings, sales contracts) are consensually verified in the network. The blockchain is the presently most widely used manifestation of a distributed ledger technology (DLT). Since the literature buy and large uses these terms synonymously, this document therefore uses blockchain as a generic designation for the DLT.

Despite there being a certain degree of media interest in the issue, there are still not many cases of application in Austria:

- One investment fund management company is using the blockchain for signing of documents and verification of data.
- One Pensionskasse is using the technology in relation to payments.
- In October 2018 a bank issued the first entirely blockchain-based capital markets issuance on to the market, which was conducted using the Hyperledger platform.

Austria's supervised entities are currently more in a position as observers, even though they are actively following technological and market developments. It therefore is not to be excluded that the level of application and the number of projects grows significantly.

Blockchain is an extremely versatile technology. From a technical perspective alone, its use in many areas looks promising. Areas that require a large amount of confidentiality or centralised management, offer slimmer prospects for making use of this.

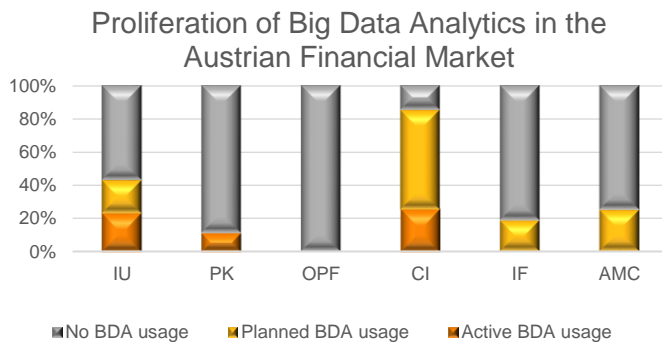
Opportunities:	<ul style="list-style-type: none"> ■ May be used in many areas ■ May primarily be used in distributed non-hierarchical systems. ■ Potential high transparency and resistance against manipulation due to consensual verification ■ High failure resilience due to the distributed structure
Threats:	<ul style="list-style-type: none"> ■ relative new and partially poorly understood technology ■ decentralised structure prevents inherent applications with centralised control ■ purely digital processability may lead to legal or technical risks ■ all of the data saved in the blockchain are public between the participants, which may have technical implications with regard to data protection

C. Technologies for data analysis

New digital technologies for obtaining and analysing data are predominantly used for product design purposes (product innovation), but may be used in a wide range of ways, and also have great potential for increasing the efficiency of internal processes.

1. Big Data

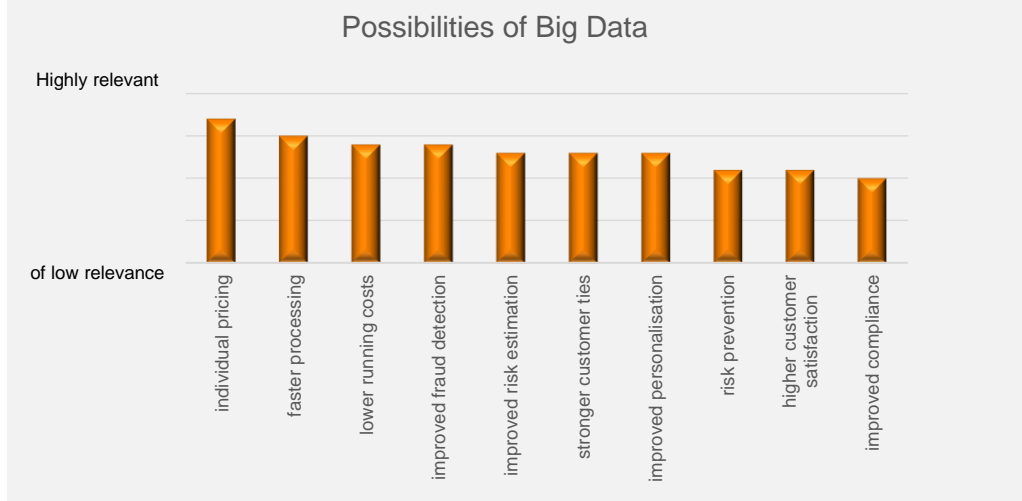
Big data is the designation for automated processing of large quantities of data (volume) in a narrow time frame (velocity) from different sources (variety).



Big data is most strongly used in the case of banks and insurance undertakings in the areas of customer relationship management, distribution, risk management and fraud detection, reporting and IT security:

Opportunities:

- More precise models may be constructed by analysing greater quantities of data.
- Individual hedging requirements and probabilities of sales can be predicted more precisely using new data analytics methods.
- Offers may therefore be better individually-tailored as a result.
- Big data applications improve analysis processes in the prevention and combating of fraud, money laundering and terrorist financing.
- Technologies like machine learning can only be realised using large amounts of data.

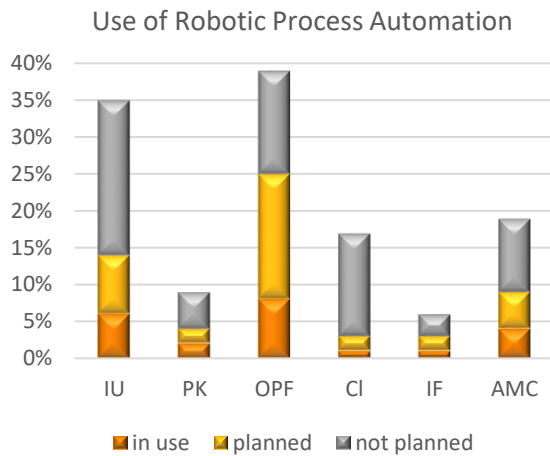


Threats:

- A lack of data quality or faulty models may distort results.
- The high complexity of analysis models may lead to deteriorating transparency and traceability
- The processing of large amounts of data also requires immense processing power.

2. Robotic Process Automation

Robotic Process Automation (RPA) is an umbrella term for “bot” software, which can perform repetitive activities in software applications, e.g. by the pre-defined execution of keyboard entries and mouse movements. Typically there is only a relatively simple decision-making logic used, and by using the mouse pointer and keyboard, the program works in the same way as a human processor would.



- This technology is already being used by around 18% of the undertakings surveyed in the digitalisation survey.
- A further 29% are planning to introduce RPA.
- The level of use of RPAs is distributed similarly in almost all sectors, with only investment service providers, with 6% active use and 12% planned use noticeably not following the trend.

Opportunities:

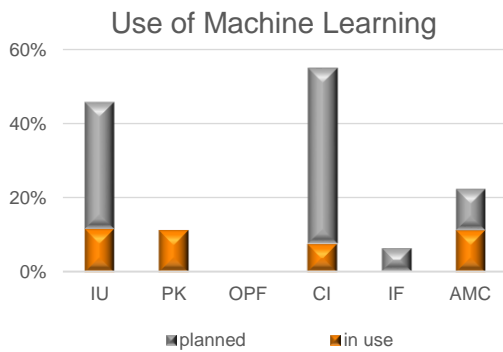
- easily and inexpensively implementable
- does not require IT skills for operation and application
- Compatible with practically every application without any need for adaptation

Threats:

- In the case of an amendment of one of the processes automated with RPAs, all bots running must consequently be adapted.

3. Machine Learning

A field of informatics dealing with self-learning software²⁷. No solution algorithm is stipulated by the programmer, and the software itself looks for the suitable approach to a problem. This procedure is particularly suitable in the interpretation and recognition of patterns in large amounts of specific data.



- Machine learning is currently not used in any financial market sector by more than 12% of the undertakings.
- It is noticeable that insurance companies want to increase use of technology to 46% by 2021, and banks to 55%.
- Machine learning is spreading significantly slower in other sectors of the financial market.

Application cases for example include the detection of attempted fraud and the automated categorisation of e-mail communications.

Opportunities:

- large amounts of data can be automatically processed in a short time.
- Very complex activities that may otherwise require an expert can be supported or taken over fully. A correctly calibrated and trained system is able to work very exactly and improves itself constantly on the basis of new data.
- Potential new and unknown relationships may be detected.

Threats:

- Problems with data quality or the statistical methodology may lead to imprecise results.
- Complexity and the “black box” effect may impede transparency.
- The system may also develop false stereotypes in an unnoticed manner as a result of incorrect learning (e.g. image recognition, recruiting tools).

²⁷ <https://www.britannica.com/technology/machine-learning>

4. Artificial Intelligence (AI)

Artificial intelligence describes the ability of machines to imitate intelligent behaviour. In this context, the ability to learn or flexibility in relation to changing framework conditions are named in the solution of problems as criteria of “intelligent” behaviour.²⁸

Examples from the Austrian market:

- An insurance undertaking is using technology to automatically process texts.
- A CI is currently in the testing phase of a project on the same issue.
- An insurance undertaking is deploying an AI-based system to support pricing.
- An asset manager is using a self-learning system for fraud detection.

Opportunities:

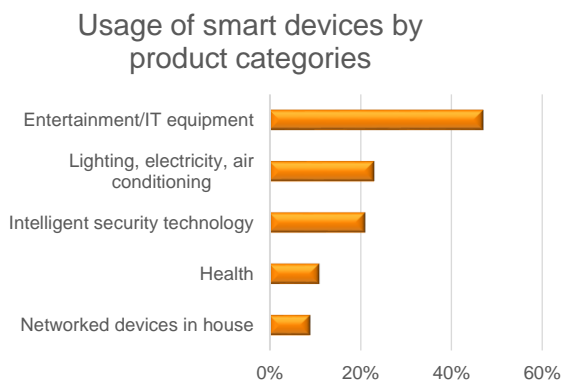
- highly flexible in its application
- may be used to obtain knowledge in complex fields

Threats:

- the precise behaviour of the CI may only be traced with particular difficulty
- Low circulation of complex CI systems and a lack of experience values make projects using this technology very risky.

5. Internet of Things

The Internet of Things (IoT) describes a global distributed network of objects that appreciate their environment and are able to communicate with one another²⁹.



- This concept which is primarily of interest for insurance companies is still underexploited in the Austrian financial market, although the IoT is already frequently represented in Austrian households³⁰: 45% of Austrian are already using IoT devices, with the figure rising to 76% among 18 to 25 year-olds.

Opportunities:

- the enormous number of devices may, where networked with one another, collect very large amounts of different data.
- New products such as behaviour-based insurance companies are being enabled in this way.
- Possible gains in convenience for customers e.g. mobile access to device functions.

Threats:

- IoT data are often collected by devices in private households, making processing especially tricky regarding data protection and privacy sphere.
- IoT devices are often not adequately secured, which in turn is accompanied by large implications for data protection and cyber risk.

²⁸ Poole, Mackworth & Goebel, Computational Intelligence: A Logical Approach, 1998

²⁹ Cf. [http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/557012/EPRS_BRI\(2015\)557012_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/557012/EPRS_BRI(2015)557012_EN.pdf)

³⁰ Cf. Kuratorium für Verkehrssicherheit, <https://www.kfv.at/kfv-smart-home-studie-2018/>

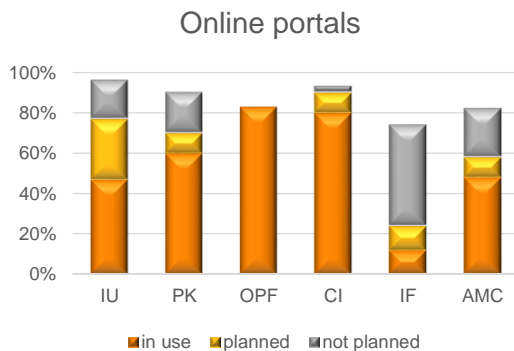
D. Technologies for Marketing and Distribution

Technologies that are used as the interface to the customer, may simplify communications in relation to damage claims or for advice purposes and may increase efficiency for the insurers as a result of (partial) automation. In addition, by investing in the undertaking's digital presences opportunities arise in relation to more effective marketing

1. Website and Online Portal

The Internet presence of an undertaking or a private person, based on HTML documents. All the undertakings surveyed in the Austrian financial market have a website. It is often the first point of contact for the customer and therefore the earliest and more widespread form of digital distribution. Corporate websites are also being expanded in terms of their functionalities. The possibility to conclude all kinds of contracts online, is becoming increasingly important and more widespread.

A further development of websites are special online portals, which permit the personalisable access to a selection of integrated functionalities.



Portal-based solutions are enjoying increasing popularity in Austria:

- Almost one-half, or 46% of those surveyed already use customer portals.
- This possibility is especially prominent among banks (80%), with portal functionality usually being integrated into their electronic banking systems.

Increasing, although somewhat weaker distribution among the other financial market participants

Opportunities:

- The website is often the first starting point for the customer and its therefore indispensable for marketing purposes.
- Increased loyalty of the customer to the undertaking
- Increased convenience and transparency for the customer
- Gain in efficiency due to partial self-administration by the customer

Threats:

- increased functionality and significance of the website increases the potential for damage from cyber risk.

2. Mobile Devices & Apps

Software and websites that are specifically designed for use on mobile devices (e.g. Smartphones and tablets) and which emphasis quick and simple operation. Mobile devices and Apps belong to the widespread digital marketing and distribution channels:

- 39% of all surveyed undertakings have established a mobile app for their customers.
- 17% of the undertakings are planning such an app.
- Apps have established themselves as a standard in the banking sector, with 83% proliferation.
- The importance of such a feature is also apparent in the insurance sector, with a constantly increasing level of penetration of 44% among IUs at present.

Opportunities:

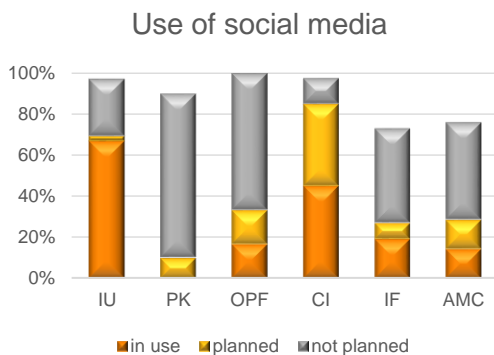
- convenient for the customer
- can be integrated well on portal solutions
- increased customer communication and retention

Threats:

- development of apps make require specialised know-how
- Since only a certain proportion of customers will use the app, all functions must as a rule also be available on another platform.

3. Social media

These applications permit users to communicate over the Internet, to form a network with each other and to exchange content.



- Social media presences are predominantly strongly used by insurance companies (70%).
- Almost half of Austrian banks (45%) already have social media presences, with a further 40% planning to do so. Larger banks use social media on the one hand to present new features and advertising on such pages, but also other the possibility to ask questions e.g. using the messaging function in Facebook.
- Social media presences are not a standard for Pensionskassen, occupational provision funds, investment firms and asset managers.

Opportunities:

- additional channel for marketing and pre-sales, various social networks in the case of a very high number of users
- may be used as an “informal” communications channel between undertakings and customers

Threats:

- not suitable for conclusion of business transactions or for exchanging confidential data
- relatively high maintenance

4. Chat bots

Chat bots are programmes that are intended to communicate with people and in so doing to act in as human as possible a way.

In Austria six insurance companies offer the possibility via their websites to ask questions to a basic chat bot. Such chat bots are also able to help customers in reporting a claims, or calculating premiums for example for health insurance and thereafter to arrange an appointment with an advisor.

- With the exception of six Austrian IUs chat bots are not yet wide-spread in the Austrian financial market, and are not yet used in other sectors.
- There is however considerable interest in the technology itself, which is demonstrated by the fact that 26% of the companies asked want to introduce a chat bot within the next three years.

Opportunities:

- offers the customer more focused information than static content
- Much lower operating costs than for personal advice
- May be operated cheaply alongside more traditional forms of communication

Threats:

- Generally inadequate in the case of complex issues
- From considerations under supervisory law the delineation to automated advice may be decisive, see “automated advice”

5. Robo-Advisors

‘robo-advice’ means the provision of investment advice or portfolio management services (in whole or in part) through an automated or semi-automated system used as a client-facing tool.³¹

Robo-Advisors are predominantly being developed by FinTechs in the Austrian financial market. Established companies are currently only using automated customer advice in individual cases, over and above simple chat bots.

Opportunities:

- extended functionality compared to chat bots permits more versatile application
- may contribute towards improved customer experience
- One of the few possibilities to (partially) automate the customer interface that is associated with relative high expense.

Threats:

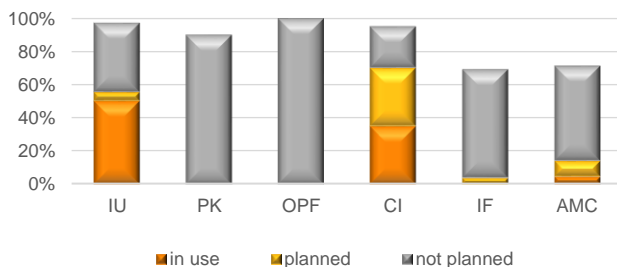
- increased liability risk
- Technically relatively demanding, since they must understand natural languages and then subsequently should make decisions on the basis of e.g. AI/machine learning

6. Comparison portals

Comparison portals are websites that allow consumers to conduct a direct price comparison between similar products and services provided by several different providers.

In recent years increasing activity of comparison portals has been observed in the Austrian market, which may primarily be traced back to the fact that customers show increased interest in obtaining an overview prior to the conclusion of a contract. Face-to-face consultations nevertheless remain an important factor in the sales process.

Use of comparison portals



IUs in particular list their products in comparison portals:

- 50% of insurance companies and
- 35% of banks use comparison portals in relation to sales.

³¹ ESMA final report: Guidelines on certain aspects of the MiFID II suitability requirements (ESMA35-43-869).

It is however **very difficult to gauge** the actual influence of comparison portals on the Austrian financial market, since only a certain proportion of customers that use comparison portals also subsequently conclude a transaction through comparison portals. It is barely discernible how many customers request an offer from a company once they have informed themselves online by means of a comparison portal.

- Opportunities:
- Many customers are already using comparison portals
 - They support quick decision-making by customers
 - May promote transparency
- Threats:
- Difficult to delineate in some cases from mediation
 - Neutrality, objectivity and completeness
 - The weighting and selection of the parameters may influence the result, while also not being transparent for the customer.

7. Targeted Marketing

Targeted marketing describes the focused and individualised addressing of the customer (for further detail see Chapter III. B.).

- Opportunities:
- needs-based conclusion, quick, uncomplicated and case-by-case coverage with a flexible contract duration, and adaptable maturity
 - risk awareness increases
 - feedback effects to the previously traditional insurance business
- Threats:
- negative risk selection
 - lack of transparency of information
 - unclear reasons for exclusion

E. Consultation about Digital Technologies

Based on your personal experiences or your estimation should other digital technologies or opportunities for deployment be considered in the observation of the implications of digitalisation on the Austrian financial market?

What lack of legal clarity are associated with the deployment of new digital technologies from your perspective?

Do you share the FMA's opinion in relation to the opportunities and threats of the individual technologies?

Which additional material risks could also be relevant from your perspective for the individual sectors in the future?

What is your expectation with regard to the role of the supervisor in the individual sectors of the financial market?

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AIFMG	Alternative Investment Fund Managers Act
API	Application Programming Interface
B2C	Business-to-Customer
BDA	Big Data Analytics
BWG	(Austrian) Banking Act
CI	credit institution
DLT	Distributed Ledger Technology
DOS	Denial of Service
EBA	European Banking Authority
EC	European Commission
ECJ	European Court of Justice
EIOPA	European Insurance and Occupational Pensions Authority
ENISA	European Union Agency for Cybersecurity
ESMA	European Security Markets Authority
ETF	Exchange-Traded Fund
EU	European Union
FMABG	Financial Market Authority Act
FSB	Financial Stability Board
GAFA	Google, Apple, Facebook and Amazon
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
HORA	Natural Hazard Overview & Risk Assessment Austria
IaaS	Infrastructure as a Service
IAIS	International Association of Insurance Supervisors
IDD	Insurance Distribution Directive - Directive (EU) 2016/97
IFRS	International Financial Reporting Standards
IFs	investment service providers and investment firms
IoT	Internet of Things
IU	Insurance undertaking
KYC	Know your Customer
MCs	Management companies (investment management companies, real estate investment management companies, alternative investment fund managers (AIFMs))
MIs	market infrastructures
OGH	(Austrian) Supreme Court of Justice
OPFs	Occupational provision funds
ORSA	Own Risk and Solvency Assessment
P2P	Peer-to-Peer
PaaS	Platform as a Service
PHI	Private health insurance
PKs	Pensionskassen
PRIPs	Packaged retail investments and insurance products
PSD	Payment Services Directive
(R)IUs	(Re)insurance undertakings
RPA	Robotic Process Automation
SaaS	Software as a Service
SCR	Solvency Capital Requirement
SIs	significant institutions
SME	small and medium-sized enterprise
UK	United Kingdom
VAG	Insurance Supervision Act 2016
VersVG	Insurance Policy Act
VN	Versicherungsnehmer
ZaDiG	(Austrian) Payment Services Act