CELENT

HISCOX: DECISION BASED CLAIMS MODELING AND EXECUTION

WINNER OF CELENT MODEL INSURER 2021 AWARD FOR LEGACY AND ECOSYSTEM TRANSFORMATION

March 11, 2021

Nicolas Michellod

This is an authorized reprint of a Celent case study. Although the reprint was prepared for Sapiens, the analysis has not been changed. For more information please contact info@celent.com

MODEL INSURER 2021

As every year since we have started our Model Insurer program back in 2006, our objective is to try to answer an apparently simple question: "What would it look like for an insurer to do everything right with today's technology?" Maybe more than ever, technology is playing an important and growing role in every insurer's strategy.

Celent has identified Model Insurers by looking at best practices in the use of technology across various areas of the industry. These areas were illustrated by case studies of specific initiatives and capabilities, selected from the many submissions received and presented in this report.

We look beyond the individual process areas and take into consideration major technology trends that insurers are implementing. Along those lines, we have identified insurers whose IT programs were submitted to Celent for awards that epitomize best practices for technology projects and stand out in each of the Model Insurer themes.

The themes are used to group the case studies in this report. Like last year, the themes represented in our 2021 Model Insurer' reports are:

- Legacy and Ecosystem Transformation
- Data, Analytics, and Artificial Intelligence
- Digital and Emerging Technologies
- Innovation Execution
- Customer Experience Transformation

We received around 100 submissions overall coming from insurers all over the globe. The competition was intense, but, like every year, we are confident that each of our chosen initiatives is a worthy winner. The winners represent a diverse group of insurance companies spanning multiple countries and several continents.

Model Insurer Themes

Celent uses five categories for its Model Insurer program:

• Legacy and Ecosystem Transformation: Legacy technology can hinder innovation, since insurers must typically offer backward compatibility. Insurers must not only modernize, but also transform their internal systems and how they interact with customers, counterparties, and regulators. This theme recognizes projects related to core system replacement or transformation including policy administration, document management, customer relationship management, new business, illustrations, billing, claims and rating/underwriting, etc.

- Data, Analytics, and Artificial Intelligence: Data is now a key source of competitive advantage for identifying profitable niches, managing risk, and improving service. External data sources, data derived from devices, and new techniques for interpreting data are pushing the competitive boundaries for insurers at an accelerated rate. This theme recognizes projects such as:
 - Predictive analytics (claims fraud, underwriting, pricing, climate analysis)
 - Prescriptive analytics (triage, sales automation, "next best action")
 - Virtualization (dashboards and heat maps, catastrophe management, network analysis, geopolitical risk analysis)
 - Innovative functionality enhancements for consumer digital platforms (e.g. mobile apps, online)
 - Artificial intelligence techniques used to achieve the next level of benefits (in underwriting, claims processing, fraud identification, propensity modeling).
- Digital and Emerging Technologies: Digital transformation is moving from person-to-person interaction toward person-to-machine or machine-to-machine. Integrating and coordinating among disparate and siloed delivery channels will be critical to satisfying ever-increasing customer expectations. Using the definition that digital automates complex tasks, allowing them to be mastered, then reproduced and distributed at no cost, this theme recognizes projects such as:
 - Online customer portals
 - The industrialization of processes
 - Development of engaging user interfaces
 - Online sales with STP
 - Integration with business partners
 - The leveraging of social networks
 - The use of mobile technology.
- Innovation Execution: Celent defines innovation as fundamental changes to products, services, or business models that break existing tradeoffs and provide value to the customer. New hardware, software, and network technologies feed insurance innovation. This theme focuses on how insurers implement innovation and recognizes projects such as:
 - Innovation labs implementation
 - Programs aiming at innovation idea generation and prioritization
 - Partnerships or investment in innovation accelerators or incubators
 - Development of an innovation culture within an IT organization
 - Change management program to foster innovation.

- **Customer Experience Transformation**: Transforming the customer experience is increasingly important to insurers who are looking to differentiate themselves and drive sustainable growth. This category looks at the work insurers are doing to improve the experience for prospects, policyholders, distributors, vendors and other constituents. This theme recognizes initiatives such as:
 - Simplification of the new business application process e,g. data prefill, new UI, computer vision etc.
 - Implementation of new technologies to improve the customer experience e.g. video communication, augmented reality for claims natural language processing, etc.
 - Implementation of new tools or services to provide new capabilities for customers e.g. connected home solutions, advice engines, social pay, etc.
 - Other initiatives that transform the customer experience.

This year's themes examine how insurance companies are achieving successes in implementing, integrating, and instilling the technology theme into how they do business, offering a new set of tools and opening the door to new rules for operations, performance, and competition. **Error! Reference source not found.** shows the distribution of submissions across the five categories.

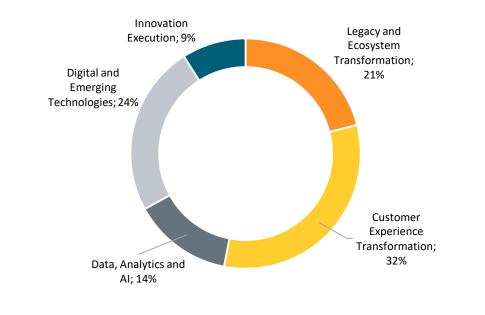


Figure 1: Theme Distribution in 2021 Model Insurer Submissions

Source: Celent

As in previous years Celent Model Insurer drew submissions from across the globe. **Error! Reference source not found.** provides a view on the nominations received by region.

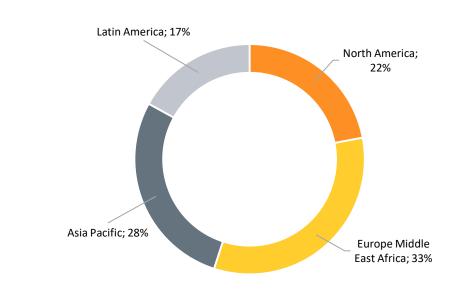


Figure 2: Celent Model Insurer 2021 Nominations by Region

Source: Celent

Nomination and Selection Process

Celent identified Model Insurer winners through the following process:

- Invitations were sent to Celent clients and nonclients. In addition, to assure the broadest public outreach, the model insurer initiative was promoted through various marketing initiatives and industry publications.
- Nomination forms were completed by insurers on Celent.com.
- Nomination forms were reviewed by Celent insurance analysts, and submissions that demonstrated innovative or effective uses of technology were selected as potential Model Insurers based on weighted assessments of several factors.
- Celent emailed several of the insurers to provide additional data and information to complete the final selection process and narrow the list of Model Insurer winners.

Once selected and accepted, Celent analysts drafted a case study for each Model Insurer which was reviewed by the insurer for accuracy and confidentiality.

Client Disclosure

There were no fees charged to insurers or vendors mentioned in this report. Some of the nominating vendors, and many of the selected insurers, are or have been clients to Celent's retained advisory service. However, Celent was not directly involved in the creation or deployment of any of the initiatives that have been recognized, and no preference was given to clients in the selection process.

CASE STUDY AT A GLANCE

Insurance companies have focused on operational efficiency to improve their technical ratio and enhance customer services for many years. However, identifying which processes or tasks are still better performed by humans remains difficult. How can insurers align their processes to offer human support where it is deemed to have the highest value for clients? Also, which tasks can be targeted for automation without negatively impacting the end clients?

FINANCIAL INSTITUTION	Hiscox
INITIATIVE	Decision-based claims modeling and execution
SYNOPSIS	Business logic automation, tailoring sets of rules for each unique claim type and managing models in a digital solution to minimize the time to make claims decisions.
TIMELINES	• 2018: program initiation
	 2019: model designs and integration
KEY BENEFITS	 90% of changes can be developed and deployed with zero IT involvement.
	 Annual 6% headcount cost savings at full benefit realization through increased claims staff efficiency.
	• 10% reduction in claim reallocations.
KEY VENDORS	Sapiens

The Hiscox Claims 2020 strategy initiative provides helpful lessons on how insurers can generate value through process automation without generating negative impacts on customer satisfaction. It is also an interesting case for understanding the importance of identifying specific tasks that can remain in the hand of human experts since they represent a fundamental value-add to clients.

CELENT PERSPECTIVE

The claims process has the highest impact on insurance clients. Indeed, it is when submitting a claim that customer expectations related to risk protection and service level are tested. The time required to settle a claim in a fair and transparent way along the claim journey is particularly crucial. There are various technologies that help make the claims journey more efficient and easier for insurers and policyholders, including connected objects, mobile technology, rule-based task processing, interactive communication channels, robotic process automation, and machine learning.

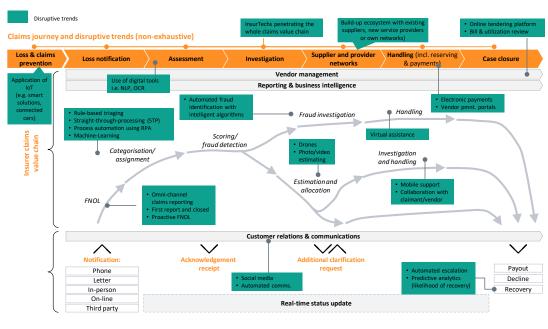


Figure 3: Disruptive Trends in Claims

Source: Oliver Wyman

Insurance companies have been increasingly using these tools and technologies to make tasks such as First Notice Of Loss, claims triage, fraud detection, claims estimation, claims handling, and payout faster to execute and more transparent.

The Hiscox Claims 2020 initiative demonstrates the trade-offs insurance companies must make to promote automation where its value has the highest potential while keeping specific tasks in the hand of claims handlers. Of course, the benefits derived from any claims automation initiative are continually reviewed and refined. However, we think the initial steps the UK insurer has undertaken represent a useful model for insurers who want to embark in similar projects. Indeed, for insurers trying

to find the right balance between automation and human tasks, the Hiscox initiative offers an important lesson on how the customers' voice must be considered and how technology can be a valuable complementary support to human services. While insurers can further automate processes, in some cases human interactions remain the best approach. Hiscox wanted to make sure that claim handlers remained a preferred notification channel available over the phone, offering customers a personal premium experience.

DETAILED DESCRIPTION

Introduction

Hiscox is an international specialist insurer, underwriting a diverse range of personal and commercial insurance risks operating across direct and broker channels. Hiscox Group has three main underwriting units:

- Hiscox London Market
- Hiscox UK and Europe
- Hiscox International, which includes operations in Bermuda, Luxembourg, Asia, and the USA

Dedicated to claims and customer services and creating policies that are in line with the risks clients face, Hiscox is a leader and pioneer in cyber cover and innovative professional indemnity products. Today, Hiscox provides commercial covers such as public liability insurance and professional indemnity insurance for over 300,000 SMEs, professionals, and consultants in the UK. The insurer also has a long history and expertise in providing specialist insurance cover for homes and their contents, valuables, and collections for over 60,000 homes in the UK.

	Hiscox
YEAR FOUNDED	Hiscox was founded in 1901 and is listed on the London Stock Exchange. Hiscox UK has over 100 years' experience in insurance, protecting businesses of all sizes.
REVENUE	£2.9B (2019)
ASSETS	£6.92B (2019)
GEOGRAPHICAL PRESENCE	Headquartered in Bermuda, with operations in the UK, Europe, Luxembourg, Asia, and the USA.
EMPLOYEES	3,300 employees (2019)
OTHER KEY METRICS	Hiscox insurance is distributed to the market via multiple channels (direct to consumers by their

Table 1: Hiscox Snapshot

	teams of experts over the phone, online, agents, brokers, and partner financial institutions, e.g., bancassurance).
RELEVANT TECHNOLOGIES AND VENDORS	Sapiens Decision, No-code, public cloud leveraging Microsoft Azure

Source: Hiscox

The Claims 2020 initiative focused on automating claims decisions, e.g., suitability for Day 1 settlement, expert instruction, recovery opportunities, special investigations, and risk assessment via business modelling of the claim's logic using a no-code environment and introducing rule-based decision-making.

Opportunity

Hiscox prides itself in the quality of its claim service, which is a key USP of their products. The insurer started the process improvement initiative by surveying its customers and partners. Indeed, considering the commercial covers offered (e.g., public liability insurance, professional indemnity insurance, specialist home insurance), Hiscox believed it was important to understand their customers' and brokers, expectations and how its claims service could be adapted to meet them. Key survey findings that helped shape the initiative's strategy include:

- Full-time claims service: A majority of customers and brokers indicated a demand for 24/7 online claims self-service.
- **More digital services**: In addition to an online claims services, nearly 60% of customers indicated they expected an online notification option.
- **Some human support**: 77% of Hiscox customers still specified a first preference for telephone journeys and human support when notifying a claim.

Hiscox understood that it needed to find the optimal balance between human and digital engagement for its claims operations. The survey results served as the basis for defining the objectives of the Claims 2020 initiative. The high-level objectives defined were the following:

- Deliver a consistent and fair claims experience for every customer, for every product and claim type, no matter the channel used to notify the claim.
- Automate the triaging of new claims to get them to the right person, first time.
- Provide prompts to the claims underwriters on what questions to ask.
- Automate basic claims decisions to allow claims handlers to focus on the more human elements of their conversations.
- Increase Day 1 settlements.
- Provide a smart and consistent omnichannel claim service.
- Ensure robust governance and controls are in place.

Improve identification of fraud and recovery opportunities.

Finally, Hiscox decided that the target goal was to make sure these objectives were complementary (not substitutes) to the natural, human, and expert conversations their claims underwriters provide to clients.

Hiscox identified an opportunity to automate standardised business logic, tailoring sets of rules for each unique type of claim and managing models in a robust, digital solution. Ultimately, the time taken to reach the best decision for a customer could be minimised. In addition, the same logic could be applied for smart, self-service journeys online, empowering customers to provide the right information at the right time to accelerate their claims journey.

In preparation for documenting business logic and improving their operating model, the first requirement was to re-evaluate how claims were segmented and enable claim complexity to be calculated based on additional factors. This process uncovered the need for business-owned change, avoiding hard-coded logic and associated rigidity. Historically, Hiscox has relied upon in-house experts delivering tailored claims services to customers. As the business grew and teams evolved, there was a requirement to ensure a standard decision quality, but also an opportunity to empower experts to focus on customers' individual needs by removing formula-based tasks. Hiscox intended to maintain and continue to grow the claims staff but optimise resourcing of experts' time and knowledge to where it was needed most by customers. In addition, as the insurer made internal processes consistent and adaptable, they needed to replicate these same benefits and consistencies in their expansion of omnichannel claims services.

Solution

As part of upgrading their policy, claims, and billing management system (called Merlin) to the most updated version, Hiscox decided to integrate their core system Sapiens IDIT with Sapiens Decision—the objective being to develop digital capabilities with focus on the UK claims notification portal.

The first use cases for Sapiens Decision as part of the Hiscox digital ecosystem focused on creating models to automate decision-making of the following processes:

- Property First Notice of Loss (FNOL) decisions, e.g., suitability for Day 1 settlement, expert instruction, recovery opportunities, special investigations. and risk assessment.
- New claims allocation and triage, including delegation of claims to appropriate service providers.
- Continued automated assessment of claims' complexity throughout their lifecycle.

Within Sapiens Decision Manager (DM), business analysts are able to design, model, and test all the rules necessary to process the underlying logic required for the business transaction, such as a claim-related transaction. Once the logic has been

modelled in DM, the analyst can deploy those models into Sapiens Decision Execution (DE), and this may be done without the aid of IT support.

The new platform was fully integrated into Hiscox's existing cloud infrastructure and is now serving and benefitting Hiscox UK as a central, unified platform that contains the single source of truth with respect to business logic. Sapiens Decision is used to power Hiscox online claims journeys. It serves to automate standard decisions and intelligently route journeys, and tailors first notification information gathering to adapt to the type of product and circumstance. The Decision solution helps guide the policyholder when submitting a new claim via the Hiscox online portal, making their journey straightforward and efficient:



	ox claims portal	
	My claim relates to Commercial property Phome and contents and contents A claim made against you or the policyholder	
	a broker a business owner	
	Back Clear answers	
	f my claim is I has been lost × ×	
	a property	
Keys to the		

Decision uses a dynamic questioning feature. The system allows for bespoke messages to be flagged to the policyholder during the journey, e.g., suggesting they call Hiscox emergency lines where their answers indicate urgent action is required to minimise the loss. A key feature of the Decision solution is the Minimum Input Optimization (MIO) feature. From the business logic held in the Decision model, the execution engine determines, in real time, the least amount of input needed from the policyholder to determine the next steps of the claims process and produce the best outcome for the policyholder and Hiscox. In some cases, the first field on the user interface is sufficient for the claim to be adjudicated; if not, then the next, least necessary amount of information is requested. This feature is entirely automated; the business analyst does not have to do any analysis to enable this best next question optimization of the user interface.

The MIO functionality benefits both the processes integrated with Merlin—where the minimum input questions are highlighted to guide the phone journey while ensuring the call is not scripted and remains human—and the online FNOL journey where the policyholder will see only the questions relevant and material to their claim.

Frequently the information necessary to make a claim decision varies and is subject to consequential logic. As more context about the claim circumstance is discovered, the system alters the line of enquiry. It often finds that the answer to one of the early questions would obviate the need for many of the subsequent questions. Using this logic allows Hiscox to create a simple, effective, and efficient customer journey that focuses on collecting the right amount, quality, and type of information.

The challenge is avoiding the complications that would arise from attempting to hard-code each of these paths into one customer journey. As a specialist insurer, every claim Hiscox handles is different; it would not be possible to cater for every potential scenario if the logic was hard coded. This approach raises barriers of cost and maintenance of the underlying systems providing these capabilities. Consider the complexities involved each time requirements are modified; the change requires analysis and coding of the impact on the pathways through the forms. Once the change is made, testing can introduce difficulties because the number of potential combinations can grow exponentially. Therefore, a hard-coding approach would likely lead to an oversimplified journey with a cost-effective solution, but ineffective information gathering.

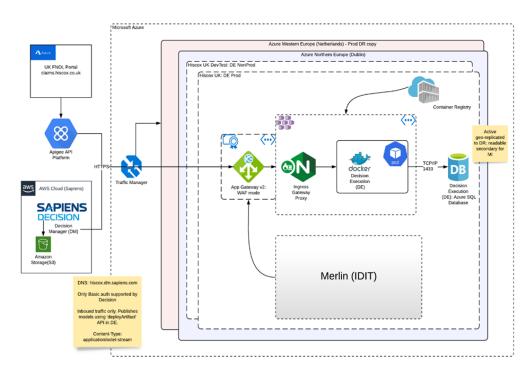
For these reasons the Sapiens Decision Manager Suite provides an optional API (called the MIO API) to Decision Execution. The MIO API automatically provides a mechanism to cue questions in the necessary order to determine the shortest path through each form interaction automatically. It does this by discovering, in advance of executing the code for the form, all the logic that needs to execute to process the form. It then presents the inputs to each individual user in the order that will guarantee the shortest interaction for that user. This eliminates the extensive analysis necessary to determine the order of the questions (no matter how complex and lengthy the path sequence may be). It also expedites the development process,

as no code needs to be written to support this requirement, and the testing cycles are dramatically shortened.

Technology

Hiscox introduced a blended SaaS / Hiscox Azure solution, with Decision Manager hosted by Sapiens as a SaaS solution and Decision Execution being hosted within the Hiscox Azure subscription. This is the first use of Azure Kubernetes within Hiscox UK for a production system. The deployment of Decision Execution within a Docker container is intended to streamline the update process when accepting a new version of the application from Sapiens.

Figure 5: Technology Deployment



Source: Hiscox

The system is also the first Hiscox UK implementation of a genuine self-service rules model platform for use by the business, allowing the analyst to compose the logic using a standard, visual, model-based approach and to rigorously test that model before deploying it directly to the development pipeline all the way to production.

Implementation

The project began in 2018 when Hiscox gathered insights from brokers and clients via its survey. The following table shows the main milestones of the project:

Table 2: Project Milestones

	W	orkstreams		
2018	•	Insights gathering via a broker and customer survey.		
	•	Claims segmentation analysis: Delivery of new logic and model for calculating claim complexity.		
	•	eFNOL process design with proof of concept for online claims and MIO functionality and a web-based form driven by Decision to help:		
		 Decide which questions to present to the user and in which order based on their answers in the customer journey. 		
		 Complete the form submission in terms of what needs to be done next. 		
2019	•	Merlin (Sapiens IDIT) Decision Integration:		
		 Translation of business logic into Decision models. 		
		 Requirements gathering and solution design. 		
		 Pre-integration Decision model testing. 		
	•	eFNOL Portal: Building of portal Decision logic and models.		
2020	•	Further Merlin Decision Integration:		
		 Build and test of Merlin upgrade. 		
		 User training including role play of FNOL calls for property claims. 		
		 Testing of integrated Merlin Decision models. 		
	•	eFNOL Portal: Continued delivery of additional customer journeys.		
Source: His	сох			

A team of 24 members (15 internal and 9 external) was directly involved in the project. The Claims 2020 team was composed of the following Hiscox resources:

- **Project Sponsor**: Head of International Claims Operations with extensive record in managing large claims teams and operational change. As owner of the outcomes from Claims 2020, the project sponsor was critical in guiding the vision and strategy, ensuring the company stays aligned to senior leadership and business goals.
- **Project Managers**: IT project managers and business project managers responsible for the planning and coordination of workstreams, resources, and interaction across departments and vendors.
- Solution Architects: Five different solution architects contributed to Claims 2020 over time. Integration architecture, API design, and security were essential to the project success, especially Hiscox's alignment to business goals of technical changes independent of IT.

• **Business Analysts**: Four business analysts with experience across claims, systems knowledge, and project analyst skills were involved. They owned the process of documenting, designing, and deploying Decision models, and were important to the integration of Decision to Merlin and the UK claims portal.

Results

While the solutions have been recently implemented and benefits are still being assessed, Hiscox has managed to generate substantial benefits in many domains:

Initial Objectives	Success Metrics
Deliver a consistent and fair claims experience for every customer, every	 Increase of customer satisfaction scores from 83% (Oct 2019) to 93% (September 2020)
product and claim type	 Increase of Net Promotor Score (NPS) from 68.3 (October 2019) to 82.0 (September 2020)
Automate the triaging of new claims to get them to the right person, first	 Simplified management of complex claims logic.
time	Business-owned process to minimize risk of misinterpreted requirements.
Provide prompts to the claims underwriters on what questions to ask	 Speed to market, including business control of configurable questionnaires allowing immediate responses to changes in claims landscape, e.g., by new COVID-specific scripts.
Automate basic claims decisions to free up capacity	 The UK claims portal served 13% of total COVID-19 related business interruption notifications.
	• 10% reduction in claim reallocations.
	 Annual 6% headcount cost savings through increased claims staff efficiencies.
Increase Day 1 settlements	• 15% increase in Day 1 (fast track) settlements.
Provide a smart and consistent omni- channel claim service	 Customer access, including omnichannel web- based portal for Hiscox customers, with a seamless online FNOL journey.
Ensure robust governance and controls are in place	 Enabled business self-service by moving beyond the traditional IT-led change management and governance. This enables changes to be implemented on the same day as the idea is raised.
	 90% of changes can be developed and deployed with zero IT involvement.

Table 3: Results

	•	Ability to rigorously test the logic using exhaustive system generated as well as real life data to ensure the integrity of the data.
	•	Reusability of business logic across multiple integrations. Developed once for all use cases.
Improve identification of fraud and recovery opportunities	•	Automation of standard policy checks to ensure all factors are considered at FNOL.
	•	Where a risk is identified, consistent additional investigative questions consistently asked to support the claim handler with sensitive conversations.
Source: Hiscox		

Lessons Learned

The main lessons learned by Hiscox can be summarized in two points:

- Knowledge and expertise transfer: Consultation and training internally at Hiscox and with its technology partner Sapiens helped establish a clear path to self-sufficiency, which allowed Hiscox to parameterize and customize questionnaires and processes.
- Claims handlers' appetite for change: Hiscox claims handlers previously had no scripts or defined steps to complete during a FNOL phone call. This allowed them to keep the call free flowing and very human. Hiscox did not want to lose the human nature of those phone calls while a claims handler was working through a guided question set. This was resolved through extensive training pre go-live where all FNOL claims handler's role played phone calls over a period of 11 weeks (while working from home). This also had a secondary benefit of testing the logic within the models against real world scenarios and the models and question sets were adjusted in response to the feedback.

Key Success Factors

Hiscox identified some key success factors that were particularly important along the project implementation:

Key Success Factor	Description
Self-sufficiency of business users	The Claims 2020 strategy initiative was not only about implementing a new system; it was about transformation. Less dependency on IT reduces the overall system development lifecycle timeline, enabling the business to quickly adopt new requirements in a lean manner, especially during volatile situations which result in surges (e.g., storms or pandemic), or as a result of national or international regulatory changes.

Table 4: Key Success Factors

	Underlying business logic for FNOL processing is defined, maintained, and governed in Sapiens Decision. This can be considered as a single source of truth within the enterprise, which once built can be applied consistently across multiple
	processes and applications. The Decision tool helps engage the business analysis community on how to understand and manage their business logic, transparency, and appeal to the business users, the outcomes of the model, and the method.
Ease of integration	With the business logic conducted as a standard web service, it offers simple, fast integration into the IT ecosystem. Also, the solution supports a hybrid cloud implementation and is technology independent, which allows for better adaptation and portability across upcoming technology usage trends and hence future proofs investment into this solution. In addition, the MIO API provides a simple way of building the user interface for portals or other systems of engagement. By removing the complexity associated with coding a customer journey containing multiple permutation combinations of paths, the initial build, maintenance, and future developments are simplified and significantly reduce cost and time to market.
Customized process	In Merlin, Decision questionnaires do not force minimum input. Instead questions are highlighted in a way that claims handlers can steer the phone conversation naturally to avoid following a script. This enables claims handlers to have personal and deeply human conversations in highly emotional scenarios, while still having the support of a Decision model to guide their key decisions. The UK claims notification portal enables all Hiscox UK brokers and customers to notify a claim at their convenience. The portal's smart and dynamic journeys are tailored to the specific circumstance of the claim and adapt in real time to the information that the customer or broker is providing online.
Source: Hiscox	Messages and advice are generated throughout the journey to guide the user during the process. This ensures the portal user provides only the information needed by Hiscox service staff.

Source: Hiscox

No specific insurance case or initiative can be widely applied. However, the Hiscox Claims 2020 strategy initiative demonstrates that technology is a major enabler to generate value while reinforcing human interventions where it is considered key to customers.

We recommend that insurers thinking about automating their core processes learn from Hiscox's experience and tailor their own initiative.

COPYRIGHT NOTICE

Copyright 2021 Celent, a division of Oliver Wyman, Inc., which is a wholly owned subsidiary of Marsh & McLennan Companies [NYSE: MMC]. All rights reserved. This report may not be reproduced, copied or redistributed, in whole or in part, in any form or by any means, without the written permission of Celent, a division of Oliver Wyman ("Celent") and Celent accepts no liability whatsoever for the actions of third parties in this respect. Celent and any third-party content providers whose content is included in this report are the sole copyright owners of the content in this report. Any third-party content in this report has been included by Celent with the permission of the relevant content owner. Any use of this report by any third party is strictly prohibited without a license expressly granted by Celent. Any use of third party content included in this report is strictly prohibited without the express permission of the relevant content owner. This report is not intended for general circulation, nor is it to be used, reproduced, copied, quoted or distributed by third parts of this report, or any opinions expressed herein, shall be disseminated to the public through advertising media, public relations, news media, sales media, mail, direct transmittal, or any other public means of communications, without the prior written consent of Celent. Any violation of Celent's rights in this report will be enforced to the fullest extent of the law, including the pursuit of monetary damages and injunctive relief in the event of any breach of the foregoing restrictions.

This report is not a substitute for tailored professional advice on how a specific financial institution should execute its strategy. This report is not investment advice and should not be relied on for such advice or as a substitute for consultation with professional accountants, tax, legal or financial advisers. Celent has made every effort to use reliable, up-to-date and comprehensive information and analysis, but all information is provided without warranty of any kind, express or implied. Information furnished by others, upon which all or portions of this report are based, is believed to be reliable but has not been verified, and no warranty is given as to the accuracy of such information. Public information and industry and statistical data, are from sources we deem to be reliable; however, we make no representation as to the accuracy or completeness of such information and have accepted the information without further verification.

Celent disclaims any responsibility to update the information or conclusions in this report. Celent accepts no liability for any loss arising from any action taken or refrained from as a result of information contained in this report or any reports or sources of information referred to herein, or for any consequential, special or similar damages even if advised of the possibility of such damages.

There are no third-party beneficiaries with respect to this report, and we accept no liability to any third party. The opinions expressed herein are valid only for the purpose stated herein and as of the date of this report.

No responsibility is taken for changes in market conditions or laws or regulations and no obligation is assumed to revise this report to reflect changes, events or conditions, which occur subsequent to the date hereof.

For more information please contact info@celent.com or:

Nicolas Michellod

Asia-Pacific Americas EMEA Switzerland USA Japan 99 High Street, 32nd Floor Tessinerplatz 5 The Imperial Hotel Tower, 13th Floor Boston, MA 02110-2320 Zurich 8027 1-1-1 Uchisaiwai-cho Chiyoda-ku, Tokyo 100-0011 +1.617.262.3120 +41.44.5533.333 +81.3.3500.3023 USA Hong Kong France 1166 Avenue of the Americas 1 Rue Euler Unit 04, 9th Floor New York, NY 10036 Paris 75008 Central Plaza 18 Harbour Road +1.212.345.3960 +33 1 45 02 30 00 Wanchai +852 2301 7500 USA Italy Four Embarcadero Center Galleria San Babila 4B Milan 20122 Suite 1100 San Francisco, CA 94111 +39.02.305.771 +1.415.743.7960 Brazil United Kingdom Av. Dr. Chucri Zaidan, 920 55 Baker Street London W1U 8EW Market Place Tower I - 4° Andar Sao Paulo SP 04583-905 +44.20.7333.8333 +55 11 5501 1100

nmichellod@celent.com