

CELENT

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# Solvency II IT Vendor Spectrum

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## Executive Summary

Insurance companies have been engaged in preparation for Solvency II for a couple of years, but not all have made their decision about technology they are still missing to address all elements of the new regulation framework. As part of their analysis, insurers need to answer important questions to identify what systems are missing within their existing IT landscape, how to fill the gaps, and which vendors are best placed to fulfill their requirements.

This report provides Celent's analysis on how insurers need to address these crucial questions before selecting an IT vendor. It also provides detailed descriptions of IT vendors and their offerings in each category of the Solvency II IT layers. This report profiles 15 IT vendors that offer IT solutions that might be identified as key elements for insurers to implement to improve their risk management framework and comply with Solvency II. Some vendors offer multiple solutions that can cover one or more areas of Solvency II, while others have a unique solution covering specific functional elements.

Each vendor is profiled using the same structure, starting with a synoptic table presenting the company and its Solvency II-related product. Celent describes the solutions' features and functionality and technology as well as implementation and costs. This report also provides tables comparing IT vendors' offerings, partnerships, and database options and programming languages.

## Introduction

Addressing Solvency II remains one of the most important preoccupations of European insurers. According to research published by Celent in the first quarter of 2012, reflecting discussions we had during the last quarter of 2011 with insurance CIOs in France and in the United Kingdom, insurers are deeply working on all aspects related to Solvency II, especially the qualitative and reporting requirements specified in Pillars 2 and 3 of the framework. In all cases, insurers need to evaluate how they can leverage existing IT infrastructures and tools but also how they can find the right balance between their internal IT resources and applications and specific technology offerings from expert system providers available on the market. Among the important questions insurance companies need to address are the following.

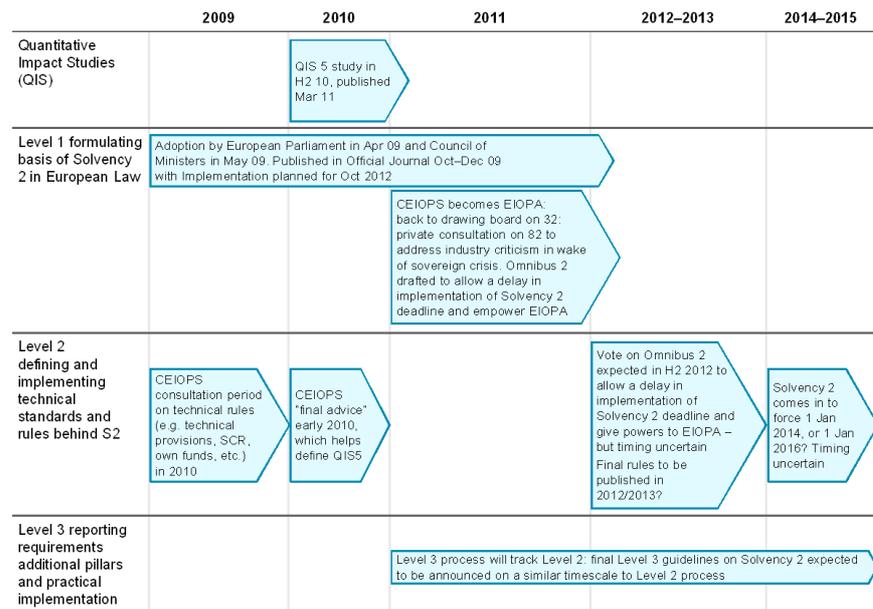
- How will insurers fill in the gaps in terms of systems?
- Will they need to outsource some development of required components or features? Will they leverage infrastructure from IT vendors to run calculation or data aggregation processes?
- How they will assess vendors' capabilities to help them be in continuous compliance with legislation changes and requirements in the long run?

After a quick update on the Solvency II roadmap and recent implementation works, the following sections will provide Celent's perspective on the above questions and profiles of solutions available on the market.

# A Solvency II Update

The Solvency II regulation definition has experienced many changes since its initiation back in 2001. Nowadays there are still question marks in the Solvency II roadmap, as shown in Figure 1.

**Figure 1: Solvency II Roadmap**



Source: EIOPA, European Commission, Morgan Stanley Research, Oliver Wyman

The recent work that has been done as well as the legislative developments to be expected in 2012 demonstrate that Solvency II remains highly political and a work in progress surrounded by uncertainties, making it difficult for insurers to prepare.

**Table 1: Timeline of Recent Solvency II Legislative Developments**

Date	Description
January 2011	The European Commission adopts its Omnibus 2 draft and transmits it to European Parliament and Council. It includes the concept of the "countercyclical premium," but no matching premium or spread adjustments.
July 2011	Draft report by Rapporteur (Burkhard Balz) with proposed amendments reducing the scope of the countercyclical premium (CCP) and removing the matching premium.  Proposal to introduce formulaic CCP, leave it to member states to decide on the use of the CCP, and limit its application to "illiquid liabilities."

Source: Updated by Celent from Morgan Stanley Research, Oliver Wyman

**Table 1: Timeline of Recent Solvency II Legislative Developments**

Date	Description
September 2011	<p>Council publishes Omnibus 2 "Compromise Text," which contains the term "countercyclical premium" in place of "illiquidity premium" for stressed markets.</p> <p>Requires the European Commission to ensure that the new regime avoids undesirable effects in its treatment of insurance business with long-term guarantees.</p> <p>Amendments tabled by Parliamentarians including a request for a "matching premium."</p>
October 2011	<p>European Commission circulates "Level 2 Implementing Measures" to European Parliament; not based on official Omnibus 2 draft, but on a new proposal for countercyclical premium and matching premium.</p> <p>Matching premium restricted heavily—to apply to illiquid, ring-fenced block of business with upfront premium (e.g., UK annuity).</p>
March 2012	<p>ECON meeting to discuss and adopt Rapporteur report with additional amendments and compromise proposals.</p> <p>Changes the countercyclical premium to refer to general "financial markets," defines reference to a "portion of the spread on representative assets," and confirms only to be used for "illiquid liabilities."</p> <p>Introduces "matching premium" (MP) as a derogation (i.e., individual member states to decide on the use of the MP). Insurers using matching premiums cannot operate outside their home market in activities relating to the business that the matching premium applies to without authorisation.</p> <p>Introduces a "dampener" for bond spread risk ("symmetric adjustment mechanism," as is already available for equities) based on a weighted average level of an appropriate bond price index calculated over an appropriate period.</p> <p>Includes a sunset clause for the countercyclical premium and matching premium; the EC must review and report after five years.</p>
September 2012	<p>Plenary session of the European Parliament to discuss Omnibus 2 to adopt ECON proposal scheduled on the 10 September 2012.</p> <p>After the hearing in Parliament, there will be three texts: the original European Commission text, the Council compromise, and European Parliament amendments. Accordingly, a phase of negotiations needs to follow until a compromise is reached. Until then, the Commission cannot circulate an "official" Level 2 draft.</p>

Source: Updated by Celent from Morgan Stanley Research, Oliver Wyman

It is in this context that European insurers are preparing for Solvency II and trying to answer critical questions related to their IT alignment.

# Three Key Questions Insurers Need to Address Early

## Best-of-Breed Vs. Enterprise Solutions

Even though there is no one approach that fits all situations, we think the preparation for Solvency II has some similarities across insurance companies. Based on our discussions with European insurers, we have noticed that the methodology used to align information systems to meet the new solvency regulation cannot escape the difficult dilemma of prioritizing a best-of-breed solution over the enterprise solution approach. We think the best way to tackle this problem is from two different but equally valuable angles.

## From the Supply Side

Celent started to look at Solvency II IT vendors and solutions back in 2008. At that time, there was not much activity in the Solvency II system area. Some vendors were still thinking how they would shape an offering, and others were focusing on hotter regulatory topics in other industries, such as Basel II in banking. We published our first report profiling Solvency II IT vendors in 2010 (*Solvency II IT Vendor Spectrum*, June 2010). This report included 17 system providers. Less than two years later, many of these vendors have merged or been purchased by other IT vendors, often vendors also active in the Solvency II space. Table 2 summarizes some of the merger and acquisition activities that have shaped the Solvency II IT vendor landscape.

**Table 2: M&A Activity**

Date	Deal
June 2009	Towers Perrin and Watson Wyatt combine to form Towers Watson.
September 2010	Wolters Kluwer Financial Services (WKFS) acquires FRSGlobal.
November 2010	Towers Watson acquires EMB.
September 2011	IBM buys Algorithmics.
December 2011	Moody's Corporation acquires Barrie & Hibbert.

Source: Company press releases

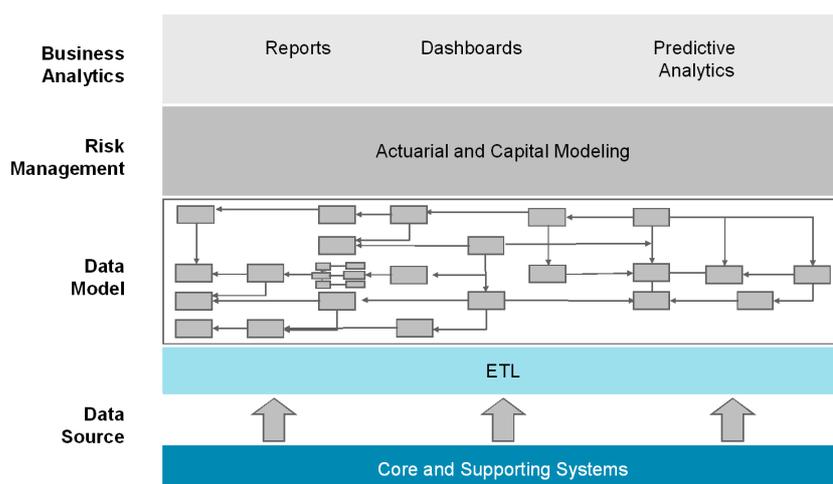
Even though the mergers and acquisitions deals listed in Table 2 are not just related to vendors' Solvency II offering, we think that the concentration taking place in this market demonstrates the need for vendors to complement their Solvency II intellectual property in areas

where they have identified weaknesses. This trend shows the difficulty of offering IT solutions that can fulfill all elements related to Solvency II, confirming the predominance of the best-of-breed approach.

### From the Demand Side

Complying with Solvency II requires insurers to align various elements of their IT application landscape, and many of them relate to specific core activities and business processes that are not always related to the same system environment. In a report published in 2010 (*Leveraging Technology to Improve Risk Management: A Solvency II Update*, January 2010), we defined the high-level Solvency II technology layers, emphasizing the need for insurers to align their IT application landscape around four elements: data source, data model, risk management, and business analytics. It goes without saying that all applications enabling compliance to Solvency II requirements need to be integrated properly to ensure efficient and frictionless communication data flow. Figure 1 describes the Solvency II technology layer framework.

**Figure 2: Solvency II Technology Layers**



Source: Celent

At each of the layers, there are specific functions and features that are needed to perform well, all elements required by the regulator. When starting a preparation programme, every insurer applies a simple analysis consisting of evaluating its existing system landscape to identify the gaps that need to be addressed to fully meet the Solvency II regulation. In a majority of cases, insurers use a bottom-up approach, starting with the data source and finishing with the business analytics layer. Others try to evaluate their current capabilities to generate the necessary calculations, optimal control procedures, risk category mapping, etc. But in all cases, there is the preoccupation to evaluate how to

improve the existing system landscape. In the frame of our discussion with European insurance company CIOs, we have noticed that this methodology leads them almost automatically to a best-of-breed approach. Indeed, when gaps have been identified, the alternative consists in making the most of existing systems, and investing in the missing pieces is the preferred approach.

In summary, our analysis of both the supply and demand sides tends to demonstrate that the best-of-breed approach is preferred by European insurers when adapting their information system landscape to meet Solvency II requirements.

## Insourcing Vs. Outsourcing

After identifying the gaps they need to fill, insurers need to answer the “how” question: whether it is better to build or to buy applications. The common arguments supporting the approach to develop specific components or features are various, and in almost all cases they can be perceived as misleading.

## Meeting Specific Needs

Insurers prioritizing internal development of IT systems often consider it important to keep the solution design in the hands of the people who know the business and the company best: the internal staff.

Although we agree that insurer staff have a deeper understanding of the operations conducted by their company, we think that Solvency II is an attempt to define a regulatory framework whose objective is to generate common outputs. For instance, the risk categories relevant for Solvency II are similar for the industry. In this context, IT vendors providing Solvency II solutions seem to be well positioned to offer valuable systems to insurers, since they have a deep understanding of all types of risks and the regulator’s requirements.

## Leveraging Past Investments and Spared Resources

The same concern (to make the most from existing systems) leads a majority of insurers to prefer the best-of-breed approach, but it can be argued that the build approach would allow insurers to tailor their solution to existing IT infrastructure (hardware and software) and to maximize existing investments. Many insurers have been developing and maintaining their IT application landscape internally for many years, so using otherwise underutilized internal staff may be a lower-cost alternative.

Maximizing existing hardware and software is an advantage of the build approach, but doing so may well encourage suboptimal decisions in the design of the application. Buying can also free up internal resources during implementation for other projects (versus in-house build) and upgrades, while costly, may involve limited effort and time. In addition, it is well known that internally developed solutions tend to be poorly documented. Finally, the internal staff may lack development skills for the modern toolset or code base and require the support of external development firms.

### Promoting Simplicity

The simplicity of the pricing structure and the investment calculation is certainly an important factor explaining why insurers prefer developing systems. Indeed, there are typically fewer or no formal license or maintenance fees in case of internal development. In addition, legal procedures and questions can make the buying approach complex.

On the other hand, simplicity in terms of pricing structure is not always a good friend. Indeed, maintenance costs with an internal development approach can prove to be higher, because there is no economy of scale. Even though procedures are simpler, it is crucial to understand that the responsibility of keeping up to date with the latest technology is the insurer's burden.

### Managing a Vendor Relationship

In many cases, steering a vendor relationship can be a challenge. Appropriate relationship management is not only required for the implementation phase but also crucial for post-implementation to ensure knowledge and future updates of the system, including regulatory changes, are installed on time and on budget.

Managing a vendor relationship can be difficult for an insurance company that is not used to doing it. But in Celent's experience, a bespoke solution typically has a longer implementation time and greater risk of failure. Another downside is that internally developed systems cannot benefit from innovation driven by a vendor or a larger user community. Keeping the solution up to date with the latest regulations is entirely the burden of the insurer if Solvency II components are developed internally, not to mention that support is available from IT vendors, sometimes 24x7.

## Celent Perspective

In summary we think insurers need to weigh and prioritize these factors before making their case for the build or the buy approach. In addition, we think there is another critical aspect insurance companies also have to consider. Indeed, because Solvency II is dependent on a massive quantity of data, insurers frequently need extra processing power to perform the necessary calculations. In this context, component software has to be implemented on commodity hardware to leverage extra hardware capacities (grid computing, for instance). A majority of IT vendors active in the Solvency II area have already implemented these kinds of infrastructure in the frame of dedicated partnerships, and therefore it is convenient for insurers to leverage their capabilities and expertise in addition to implementing their solutions.

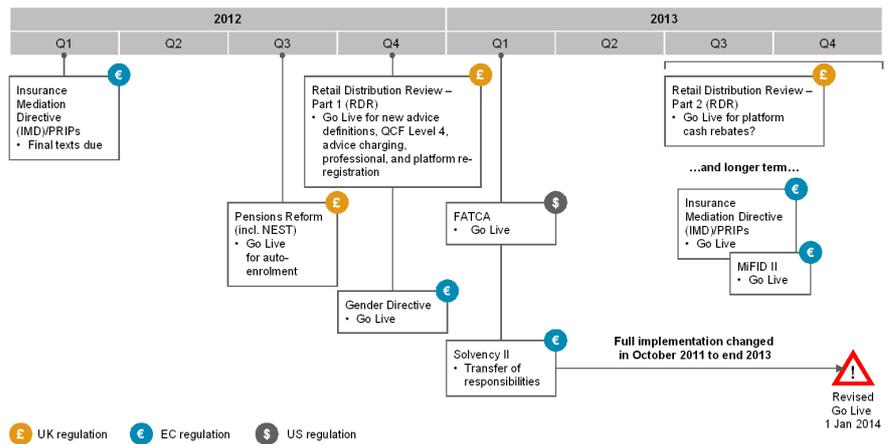
## Adapting Solvency II Solutions to Regulatory Changes

One argument in favor of the purchase of components or Solvency II solutions is certainly the support IT vendors can offer in terms of adaptation to changes to the regulation. Indeed, we think there are important reasons why IT vendors need to demonstrate their ability to keep their solutions up with potential Solvency II regulatory changes and ensure these are incorporated in future releases.

## Insurers Are Overwhelmed with Regulatory Constraints

Insurers are not just working on complying with Solvency II. Insurance companies in certain European countries are rethinking their business model and IT operations to reflect new regulations. Figure 3 provides an example of regulations UK life insurers with cross-country activities need to address within the next couple of quarters.

**Figure 3: UK Life Insurer Typical Regulation Roadmap**



Source: Celent

The UK example is just one among others in Europe. But in the UK case, we have to emphasize that efforts required by insurers are particularly consequential. Beside the heavy investments and adaptation efforts Solvency II programmes imply, the Retail Distribution Review (RDR) presents an additional concern, monopolizing money and resources and prompting new strategic thinking around distribution.

## The Ever-Changing Solvency II Roadmap

The roadmap for Solvency II has experienced many changes. As mentioned in Figure 2, the new effective implementation of the European prudential regulation is now planned for January 2014, but new clarifications are expected from the regulator prior to this date, notably around regulatory reporting.

This does not even mention the impact of the economic situation on Solvency II implementation phases, such as the Quantitative Impact Studies (QIS). The interactive approach, involving various insurance associations and political and government bodies in the Solvency II implementation process, has generated delays and confusion for insurers over the past five years. In this context, insurers that are preparing for Solvency II need to make additional efforts to keep pace with

changes. This is why a growing number of them are asking for support from specialized actuarial firms that keep informed about the latest news and updates surrounding Solvency II.

## Data Management Complexity

Solvency II requires not only that insurers meet capital requirements but also that they prove they have a sound and efficient enterprisewide risk management framework in place. The raw material that feeds the risk management framework and therefore conditions its results and its efficiency is data. Taking into consideration the comprehensiveness of risks included in the solvency regulation, insurers have to identify, manage, and monitor all categories of risks. Figure 4 provides an example of the sets of risks and therefore data needed.

**Figure 4: Risk Categories**

1	Insurance risk	2	Market risk	3	Default risk	4	Operational risk	5	Other risks
Risk categories									
	<ul style="list-style-type: none"> <li>▪ Premium risk</li> <li>▪ Reserve risk</li> <li>▪ CAT risk</li> <li>▪ Mortality risk</li> <li>▪ Longevity risk</li> <li>▪ Lapse risk</li> <li>▪ Expense risk</li> <li>▪ Disability risk</li> </ul>		<ul style="list-style-type: none"> <li>▪ Equity risk</li> <li>▪ Interest rate risk</li> <li>▪ Property risk</li> <li>▪ FX risk</li> <li>▪ Spread risk</li> <li>▪ Concentration risk</li> <li>▪ Diversification</li> </ul>		<ul style="list-style-type: none"> <li>▪ Default of Reinsurance</li> <li>▪ Default of Investments</li> <li>▪ Default of Broker</li> <li>▪ Default of Policy Holder</li> </ul>		<ul style="list-style-type: none"> <li>▪ Process Risk</li> <li>▪ Communication</li> <li>▪ Staff risk</li> <li>▪ IT system risk</li> <li>▪ External Risk</li> <li>▪ Outsourcing risk</li> </ul>		<ul style="list-style-type: none"> <li>▪ Liquidity risk</li> <li>▪ Strategic risk</li> <li>▪ Reputation risk</li> </ul>

Source: Celent

The quantity and quality of data needed to monitor the risk categories listed in Figure 4 add to the complexity of the risk management framework insurers need to implement and maintain. This complexity leads insurance companies to seek external support, including IT vendor consulting skills.

## Relying on Competent and Informed Partners

The flood of regulation to address the continuous changes of the Solvency II implementation roadmap and the complexity of the regulation, especially with regard to risk data, make insurers' work difficult. In this context, we recommend that IT vendors demonstrate:

- **Capabilities to understand insurers' preoccupations and feedback.** Without a good understanding not only of regulation but also of business challenges faced by insurance companies, it is difficult for IT vendors to deliver high-quality services. In addition, we recommend Solvency II IT vendors frequently gather insurance business user feedback about their solutions in order to include valuable improvements in new releases.

- **Ability to quickly adjust their Solvency II solution.** IT vendors should have people involved in discussions with the parties playing a role in the Solvency II regulation implementation, such as the European Insurance and Occupational Pensions Authority (EIOPA). Being close to these bodies allows them to demonstrate their knowledge of what is going on when talking to their insurance clients, and also to adapt their solutions quickly to changes to the regulation. In times where there are still clarifications needed, notably around regulatory reporting, being able to demonstrate a good understanding of the latest discussions increases the trust insurance clients place in their IT vendor partners.
- **Ability to implement new releases.** We think it is important for IT vendors to demonstrate that they have an efficient and transparent release path. They need to update their system on time to allow changes required by the regulator to be taken into consideration, and when possible we recommend that they issue detailed release implementation procedures.

# SAS: Risk Management for Insurance (RMfi) & SAS EGRC

SAS Institute is a provider of business analytics software and services and a large independent vendor in the business intelligence market. Founded in 1976, the privately owned company serves a range of industries including financial services, government, services, communications, life sciences, manufacturing, retail, education, energy, utilities, and healthcare.

**Table 45: SAS Snapshot**

<b>Company Information</b>	
Company Size	12,701 employees, 80 of who form a dedicated Solvency II team Europe-wide.
Headquarters Locations	Cary, NC, US with European presence notably in the UK, France, Germany, Italy and Belgium
<b>Solvency II Solution</b>	
System Name	SAS Risk Management for Insurance (RMfi) & SAS EGRC
Launch Date	2009
Last Major Release	2011
Annual revenue derived from the Solvency II product	€12 million
Type of Solution	Actuarial calculation engine, risk management (capital modeling), data modeling, analytics and reporting, GRC
<b>Customer Base</b>	
Clients	32 in production and 6 in implementation
Countries where the solution is implemented	UK, Italy, Germany, Belgium, Denmark, France, Austria, Netherlands, Spain Sweden, Greece, Czech Republic, S. Korea
New clients Since Jan. 1, 2010	30
Proportion of clients using the last major upgrade / release	25%
Marquee clients	HDI (Italy), Unipol (Italy), P & V (Belgium)

Source: Vendor RFI

## Functions and Features

Table 46 lists the functions and features of SAS's RMfI & SAS EGRC.

**Table 46: Functions and Features**

Functions	Availability
Prebuilt Solvency II data model	In production today
Calculation of economic capital using inputs from multiple existing systems	In production today
Extensive quantitative risk models and techniques	In production today
Ability to perform real time solvency and "what if" calculations	In production today
Integration with or availability of other risk types (market risk, operational risk, etc) and functionality (e.g., single view of risk/financial data or capital allocation)	In production today
Stress testing and back testing toolsets	In production today
Open, modular middleware	In production today
Automated and configurable data synchronization capability, e.g., for data conversion or data cleansing efforts	In production today
Scalable and able to manage large volumes of data using latest high-performance infrastructure technologies (e.g., grid)	In production today
Automated data quality detection and integrity management functions	In production today
Logical data mapping, modeling and visualization tools	In production today
Adaptable and user-definable report authoring	In production today
Advanced data visualization functionality, specific to various sector/department audience groups	In production today
Support for multiple data sources e.g. using web services-based architectures to consolidate single view of data	In production today
Broad range of "standard" prebuilt reports, e.g., corporate performance and risk management reporting (if supported please list the reports available)	In production today: SAS support more than 50 risk reports including the Solvency II QRT reports
Automated workflows for report generation and compliance activities	In production today
Compliance support over multiple offices (e.g. information about regulators, documentation/ records, collaboration between audit, compliance and regulator groups, audit trails, knowledge sharing, etc.)	In production today

Source: Vendor RFI

The following table lists the components of the solution and provides a description of what they do in the vendor's own words.

**Table 47: Solution Components**

Component	Description
Underwriting Life Risk Management	Valuation of life insurance assets and liabilities using an extensive library of functions
Underwriting P&C Risk Management	Prebuilt framework for estimating loss reserves and calculating and aggregating risk capital charges

Source: Vendor RFI

**Table 47: Solution Components**

Component	Description
Market Risk Management	Allows risk analysts to configure and calculate market value of financial instruments and assets
Firmwide Risk Management	Aggregates risk across the enterprise & calculates the quantitative metrics required for Solvency II
Risk Data Management	Enables insurers to acquire and consolidate data from internal and external sources for risk analysis
Risk Reporting	Extensive reporting capabilities and risk dashboard functionality including support for XBRL taxonomies

Source: Vendor RFI

SAS RMfi and SAS EGRC support multiple currencies and languages in a single instance. The solution currently supports Chinese, Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Russian, Spanish, and Turkish. Support for numerous other language families is provided in the base SAS environment

## Technology

Table 48 lists the main technology characteristics of SAS RMfi & SAS EGRC.

**Table 48: SAS RMfi & SAS EGRC Technology Options**

<b>SAS RMfi &amp; SAS EGRC Technology</b>	
<b>Code Base</b>	
Features/functions/screens for everyday business users	SAS (SAS application is built on a Flash/Flex-based architecture)
Configuration and Development	SAS
<b>Operating Systems</b>	
Preferred Options	Windows
Additional Options	OS/390 or z/OS, Unix, Linux and also Solaris
<b>Databases</b>	
Preferred Option	SAS/ACCESS® engines, which provide read/write/update access to more than 60 data sources, including relational and nonrelational databases, PC files, and data warehouse appliances, including Informix, ODBC, OLE-DB, SQL on UNIX, Teradata, MySQL, Netezza, and many others
Additional Options	Oracle, DB2/UDB, Microsoft SQL Server, Sybase, MySQL, SQL on UNIX
<b>Methods of integration</b>	
Preferred Option	Oracle WebLogic Server (BEA) and JBoss (Red-Hat)
Additional Options	WebSphere (IBM)

Source: Vendor RFI

The analytical processes of the solution are designed to utilize the SAS scalability capabilities. SAS can scale out and across normally. It is only the hardware that limits SAS scalability. SAS datasets have no practical size limits. SAS offers its own grid computing infrastructure, noting that none of the vendor's clients use the solution on a SaaS basis or have deployed the system in a cloud.

## Implementation and Costs

The time from project initiation to get the system up and running is typically 12 to 18 months. A typical implementation team would consist of 10 to 30 total, based on size and complexity, 25% of them being staffed by SAS, 25% insurer, and 50% from other professional services.

The main cost in the first year comes from the software license, which takes 60% of the cost. The remainder is split between the installation and customization (35%) and training (5%). SAS' licensing model is a subscription-based fee. The customer pays a first year fee and has the option to renew annually.

For a regional insurance company with four lines of business, producing annual premium of €250 million, the total cost including license, implementation, and maintenance would be in the range of €100,000 to €600,000. For a typical insurance holding company with four life/health companies, writing business in five or more European countries, with a total combined DWP of €2.1 billion, a larger fee between €1 million and €3 million would be charged in the first year, which includes license fees costing between €500,000 and €1.5 million. Cost of maintenance is typically 30-40% of the license fee.

## Leveraging Celent's Expertise

If you found this report valuable, you might consider engaging with Celent for custom analysis and research. Our collective experience and the knowledge we gained while working on this report can help you streamline the creation, refinement, or execution of your strategies.

### Support for Financial Institutions

Typical projects we support related to Solvency II include:

**Vendor short listing and selection.** We perform discovery specific to you and your business to better understand your unique needs. We then create and administer a custom RFI to selected vendors to assist you in making rapid and accurate vendor choices.

**Business practice evaluations.** We spend time evaluating your business processes. Based on our knowledge of the market, we identify potential process or technology constraints and provide clear insights that will help you implement industry best practices.

**IT and business strategy creation.** We collect perspectives from your executive team, your front line business and IT staff, and your customers. We then analyze your current position, institutional capabilities, and technology against your goals. If necessary, we help you reformulate your technology and business plans to address short-term and long-term needs.

### Support for Vendors

We provide services that help you refine your product and service offerings. Examples include:

**Product and service strategy evaluation.** We help you assess your market position in terms of functionality, technology, and services. Our strategy workshops will help you target the right customers and map your offerings to their needs.

**Market messaging and collateral review.** Based on our extensive experience with your potential clients, we assess your marketing and sales materials-including your website and any collateral.

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[Solvency II Quantitative & Strategic Impact: The Tide Is Going Out](#)

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[Solvency II IT Vendor Spectrum](#)

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[Leveraging Technology to Improve Risk Management: A Solvency II Update](#)

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April 2008

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