4SIGHT

FINANCIAL SOFTWARE

COLLATERAL HEALTHCHECK
BENCHMARKING YOUR COLLATERAL
SYSTEMS AND PROCESSES
AGAINST BEST PRACTICE

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Benchmarking Your Collateral Processes & Technology

Collateral management is changing rapidly to meet the demands of the new post crisis environment.

Some of the challenges include:

- Mandatory central clearing of derivatives

- Increasing volumes of calls

- Forthcoming IOSCO rules for uncleared derivatives

- Growing scarcity of high quality liquid assets (HQLA)

- Regulatory liquidity ratios (e.g. Basel III NSFR/LCR)

- A rising trend for collateralising with non-cash assets

- Centralisation of collateral usage across business lines

These trends mean that legacy technology systems and spreadsheets are no longer fit for purpose, placing added strain on firms engaging in collateralised trading and constraining business growth.

Adapting to this new world while retaining profitability can be challenging. It is difficult to know where to start when defining a target operating model that clearly identifies the changes required to systems and processes.

4sight's collateral healthcheck provides an initial starting point to benchmark your firm's current state against market best practice. It offers a checklist of key functional areas that firms should seek to meet if they wish to run an efficient collateral management desk that supports the goals of mitigating risk while minimising unnecessary costs.

Improving collateral management typically centres on changes to people, processes and technology. This guide mainly focusses on the technology aspects, with process covered as well.

It is by no means a fully comprehensive guide. A typical RFP for a collateral management system often involves hundreds of detailed questions. It is designed as a starting point, to stimulate thought on what your collateral processes and systems could look like in an ideal scenario and to provide ideas on how to evaluate technology systems.

Because of the varying challenges and opportunities for different types of market participant (a small buy side firm vs a large global broker dealer for example), not all of the questions may be relevant to all participants.

Furthermore, while many of the Basic and Intermediate activities by their nature precede the Advanced and Optimised they are not all necessarily dependent.

Defining Goals

It is important to think about the constraints your firm is trying to deal with by enhancing systems. Some examples include:

1. Operations are strained, resulting in increased staffing costs

2. The firm is suffering from settlement failures and missing cut offs

3. The CCP clearing process is too complex for the firm to handle using current systems

4. Processes often break down due to human error

5. Collateral costs are impacting P&L

6. The firm is struggling to source high quality liquid assets to collateralise positions/meet regulatory ratios at low cost.

The main goals of efficient collateral processes should focus on defining a target operating model that:

1. Mitigates the following risks:

- Credit Risk

- Market Risk

- Liquidity Risk

- Concentration Risk

- Settlement Risk

- Operational Risk

2. Minimises the strain on operations personnel and reduces the need for additional headcount to support the collateral process

3. Facilitates business growth

4. Keeps control of collateral costs and takes advantage of opportunities to increase P&L around collateral holdings
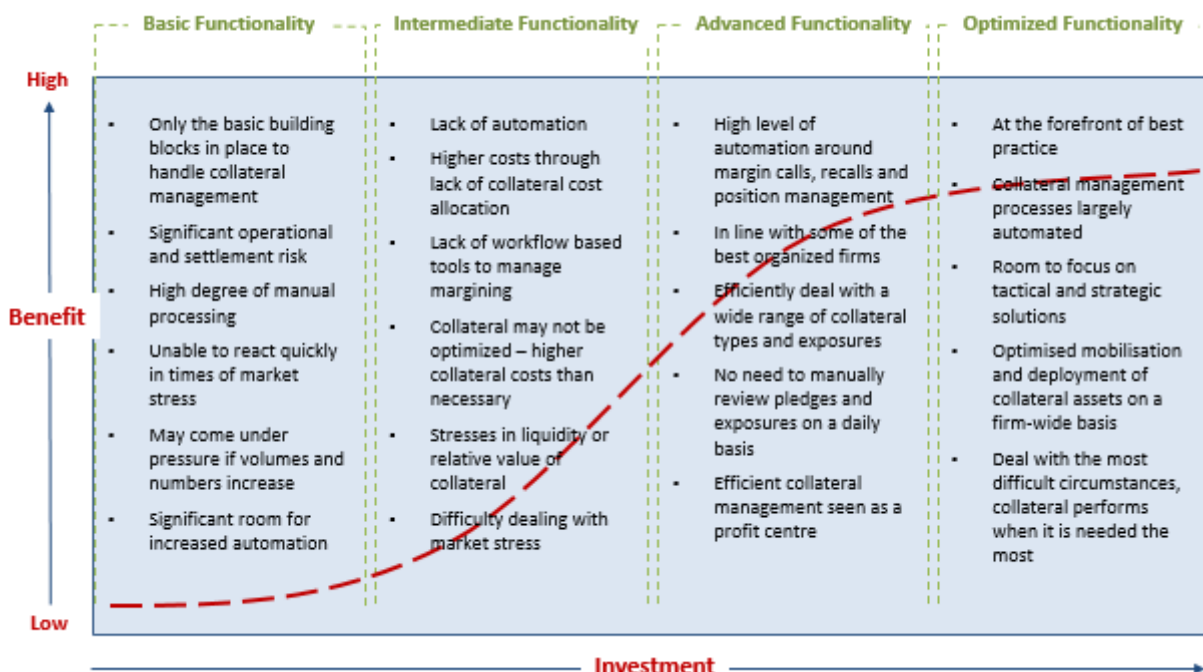
Defining Goals (Continued)

The relative importance of these goals varies from firm to firm. In defining an operating model, it is critical to decide on the correct weightings to place on each of these criteria.

For example, some buy side firms may not be facing the same problems sourcing high quality liquid assets (HQLA) to collateralise their derivatives trades that a large sell side firm faces trying to locate these assets at term, to meet its Basel III Liquidity Coverage ratios.

The cost pressures and constraints are clearly very different for these firms and the target operating model must take this into account.

The chart below and following summary of each level of the grading system contained in the healthcheck tool provides a more detailed discussion of the features, benefits and shortcomings of each level of sophistication.

Basic Functionality	Intermediate Functionality	Advanced Functionality	Optimized Functionality
• Only the basic building blocks in place to handle collateral management	• Lack of automation	• High level of automation around margin calls, recalls and position management	• At the forefront of best practice
• Significant operational and settlement risk	• Higher costs through lack of collateral cost allocation	• In line with some of the best organized firms	• Collateral management processes largely automated
• High degree of manual processing	• Lack of workflow based tools to manage margining	• Efficiently deal with a wide range of collateral types and exposures	• Room to focus on tactical and strategic solutions
• Unable to react quickly in times of market stress	• Collateral may not be optimized – higher collateral costs than necessary	• No need to manually review pledges and exposures on a daily basis	• Optimised mobilisation and deployment of collateral assets on a firm-wide basis
• May come under pressure if volumes and numbers increase	• Stresses in liquidity or relative value of collateral	• Efficient collateral management seen as a profit centre	• Deal with the most difficult circumstances, collateral performs when it is needed the most
• Significant room for increased automation	• Difficulty dealing with market stress		

Benefit (High / Low) vs Investment chart

Choosing a Target Operating Model

Choosing a collateral system and defining the target operating model for your collateral needs are interlinked decision processes. The choice of system greatly affects the choices that can be made about the operating model. The correct approach is to assess the target operating model first. Then, from there, consider the choices of functionality that different system choices can provide. Finally, one can reassess the operating model to adjust for any system limitations.

This process can be challenging, not least, as collateral management is becoming a vital service in support of a wide range of other product lines. The choice of collateral operating model can have significance influence on products offered and utilized by the firm.

Further complicating the decision-making processes are the inter-dependencies between system functions. In addition, the need to make trade-offs between the benefits of different models can limit the potential outcomes of the target operating model.

Following a few key steps can help to inform decision making in choices between operating models.

Identify

- Key Performance Indicators (KPIs)
- Functional choices
- Inter-dependencies between functions

Assess

- Stakeholder minimum requirements for each Key Performance Indicator (KPI)
- Correlations between Key Performance Indicators

Tools such as the collateral healthcheck can be used to provide quantification to the analysis and help to frame the discussion.

Key Performance Indicators

In order to assess a target operating model, it is important to choose key performance indicators (KPIs). The next step is to benchmark each choice in function against each KPI. One can then assess different operating models, or scenarios, by the total score in each KPI.

Examples of KPI for a collateral operating model would include such factors as cost of implementation, cost of maintenance and staffing, profits or reduced losses, reduction in risks and ability to meet future business requirements.

For simplicity's sake, for this example we have chosen three KPI's:

- Cost Benefit
- Operational Risk Management
- Flexibility

Choosing a Target Operating Model (Continued)

Cost benefit is the gain in efficiency of collateral usage minus the cost of the new system implementation and maintenance. We have selected 'Operational Risk' as the most appropriate risk measure, as it is in controlling operational risk that a collateral manager is able to aid the firm in minimizing other risks such as credit risk.

We have included 'Flexibility' to reflect the fact that many firms find that implementation of solutions that are too complex can lead to prohibitive costs in adding further products or attempting to change the business model at a later date.

This scale then needs to be translated into real world consequences, whether relating to direct monetary effects or examples of different effects that increase in likelihood along the scale. This allows stakeholders to easily assess what the scores mean for each KPI. It is also sometimes worth examining the correlations between KPI as these limit the choices that can be made.

The diagrams below show the hypothetical analysis of a business and its potential collateral operating models. This helps to visualize how the key performance indicators can be related and the consequences of this.

Figure 1.1 shows un-correlated outcomes allowing for the selection of each KPI score independently of the other factors. Figure 1.2 is a three dimensional graph where the axes are no longer at right angles to each other. This shows a more realistic model where choices in one KPI affect the score in another. For example, choosing to implement detailed collateral schedules within a system can greatly reduce operational risk and improve collateral optimization. However, it will also reduce flexibility as the burden of adding new counterparts and products increases.
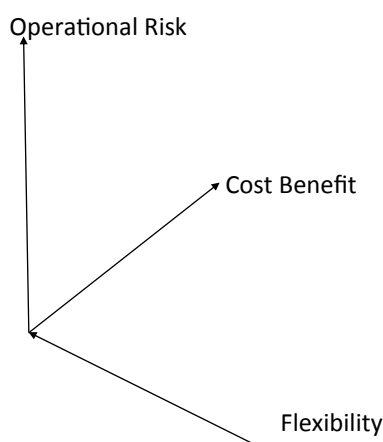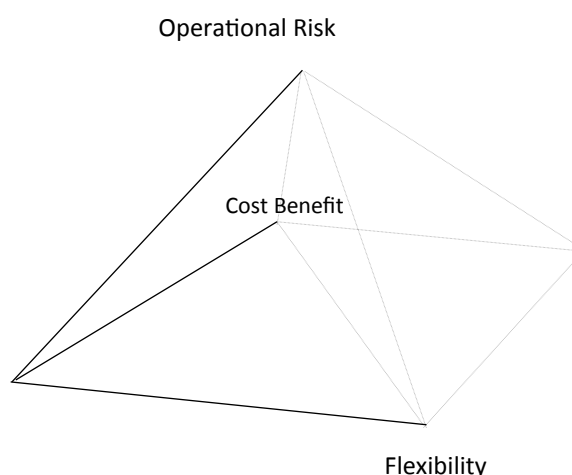
Figure 1.1. Key Performance Indicators

Operational Risk

Cost Benefit

Flexibility

Figure 1.2. Inter-related Outcomes

Operational Risk

Cost Benefit

Flexibility

As the scales are refined and the inter-related consequences of choices defined, the shape of the space in which decisions can be made will change. Likewise, choices between systems and firm business models can also change the relationships between the KPI.

For example, a firm that is always long high grade and unencumbered collateral relative to its margin requirements will see little benefit from collateral optimization. It will therefore not gain from increasing complexity. This would mean that cost benefit would in fact decrease, with rising cost and little benefit. This is because the ability to handle operational risk increases and thus the axes would be far more closely related.

A firm used to handling cash collateral only, may find that some combinations of functions lead to a reduced ability to manage operational risk, without for example robust corporate action or settlement handling.

There are a few further points to note: Not all outcomes are feasible. It is therefore best to exclude some of them from the analysis. Functional interdependence and the modular nature of functions mean that it is often not possible to find the perfect operating model. This then requires some compromises.

More complex relationships between key performance indicators may create scenarios in which distinctly different operating models become viable options.

Figure 1.3. below demonstrates how minimum requirements in cost benefit and operational risk management create a space within which the optimum operating model must lie. In this instance, only the area to the left hand side of the grey surface of the pyramid represents real world solutions. The area above the flat green surface represents solutions acceptable from an operational risk perspective. The area to the right of the blue surface represents solutions acceptable from a cost point of view.

Figure 1.3. Stakeholder Minimum Requirements
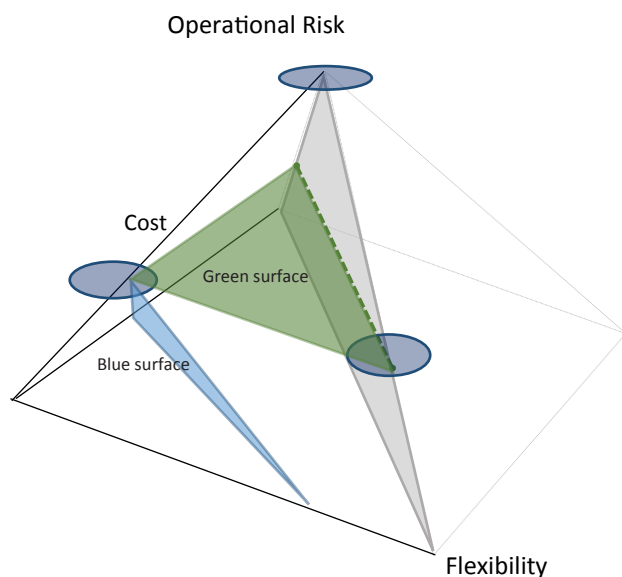
Finally figure 1.4. shows how the minimum requirements and limitations create a space within which the acceptable range of outcomes lie in blue. Combined with the initial analysis to score each functional choice, this allows a list of mandatory functions to be drawn up as well as a list of optional functions to choose between.

Figure 1.4. Target Operating Models
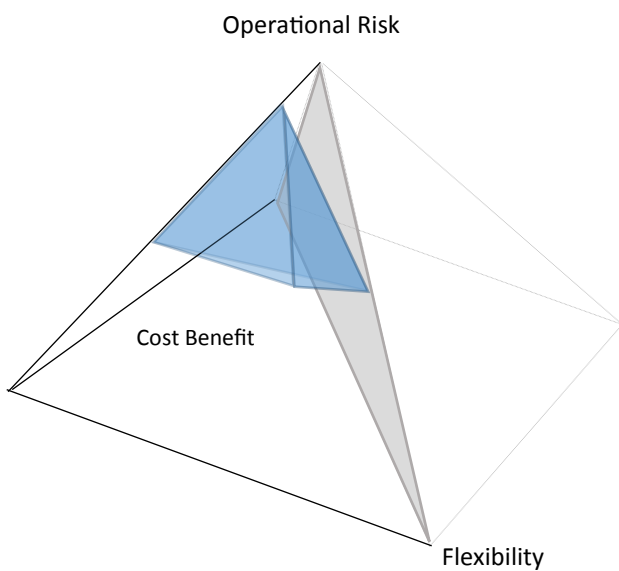
Collateral Functionality Trees

In order to build out a scoring mechanism such as that used by 4sight's Collateral Healthcheck tool, it is necessary to construct functional trees to assess the inter-dependencies between functions.

Functional trees are simply decision flow charts with yes and no answers to questions based on the availability of functions. The detail level is dependent on the required detail of the analysis, but even simple trees can be useful as the formation of the diagram can help to organize thoughts around where dependencies lie.

Figure 1.5. shows a simplified functional tree assessing the ability to utilize automated collateral optimization algorithms. It is then possible to use the dependencies to create the kind of inter-dependent scoring as used in the Collateral Healthcheck tool. This scoring methodology then helps to highlight requirements to ensure the core of the operating module is in place. From there, more advanced tools can be successfully used.

Figure 1.5. Example Collateral Functional Tree
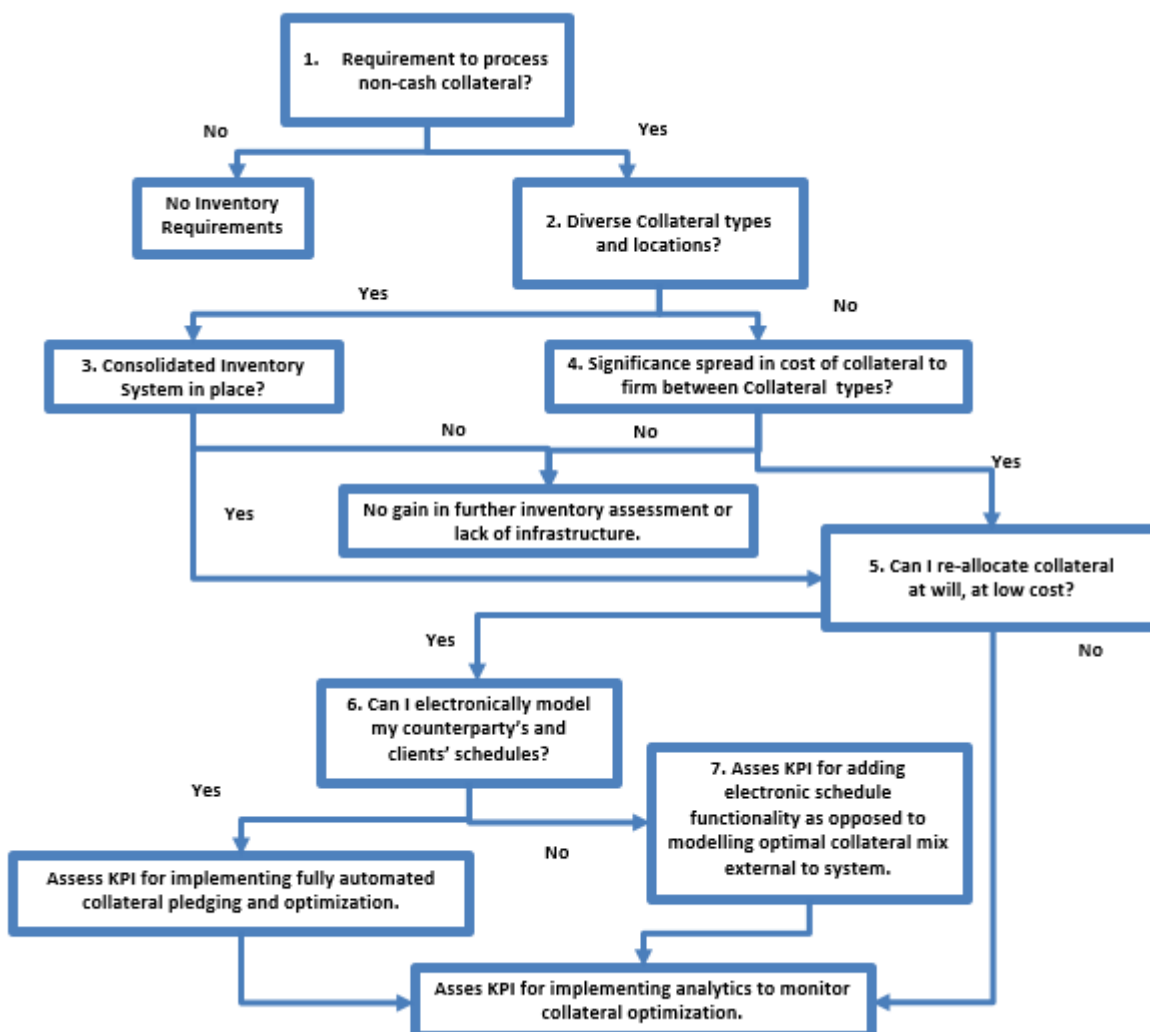
Formulating a Plan

After establishing the range of potential operating models, it is now possible to assess the differing options for common core functional requirements. This presents a list of mandatory functions. The optional functions can then be grouped for each potential model.

This then allows the decision makers the flexibility to review their system and other choices in the context of core requirements and useful groups of further functionality. In addition, this allows the project to be devised in phases.

Often the core functional requirements such as collating the entire firm wide inventory into one system, can in itself be a substantial project which can take a long time. Moving the project into phases allows the initial rollout of known mandatory requirements to commence.

It then enables further analysis on whether the optional aspects such as fully automated optimization across clients and products are required - or whether to focus on reporting and tools to support manual decision making.

As the plan unfolds, this opens up the potential to change between target operating models without having wasted resources or time. It allows the plan to keep up with the still changing market place.

The following sections summarise each level of the grading system used in the healthcheck and provide a more detailed discussion of the features, benefits and shortcomings of each level of sophistication.

Basic: Score Between 1-25

The following sections describe the benefits of each level of sophistication. They also cover some of the costs and risks of operating at a given level versus the benefits of the more advanced functional levels.

A score between 1 and 25 indicates the most basic level of sophistication in managing collateral. This sees collateral management as an operational process and cost centre. The bare minimum is done to ensure day-to-day running of the collateral book and meet regulatory requirements.

Much of the collateral management process is manual and run from spreadsheets, leading to significant operational risk. The basic approach is cheap to run from a systems and personnel perspective but leads to unnecessary collateral costs, missed opportunities and increased operational and liquidity risk.

In the current trading and regulatory environment of derivatives central clearing and with more stringent rules around uncleared margining soon coming into force, this type of set up is only suitable for firms trading no more than a handful of CSAs daily.

For firms trading derivatives more frequently or engaging in the securities lending and repo markets, using this basic level of collateral infrastructure will almost certainly lead to inefficiencies.

Benefits

- Low system costs

Risks/Costs

- Heavily reliant on the knowledge of a few key people
- Often uses unsupported spreadsheets prone to human error
- Significant operational and settlement risk
- High degree of manual processing
- Unable to react quickly in times of market stress
- No optimisation of collateral costs
- Business growth is constrained

Intermediate: Score Between 26-50

A score between 26 and 50 indicates an intermediate level of sophistication in managing collateral. While basic processes have been automated, there is still significant room for improvement. The modelling of counterparty collateral schedules and legal agreements reduces some of the effort spent manually checking collateral against agreements.

However, at this level, there is no automated suggestion of collateral to pledge to meet bilateral counterparty/CCP margin calls. There is also a lack of automation around the manually intensive CCP/FCM margining process, which can provide major benefits in meeting settlement cut-off times for margin calls.

Benefits

- Clearer views of risk through ability to view exposures at multiple levels of the firm from top down to book level
- Can deal with real time/intraday margining
- Reduced operational risk through electronic modelling of eligibility, concentration and haircut schedules
- Can mitigate concentration risk
- Reduced settlement risk

Risks/Costs

- Lack of automation, particularly around CCP/FCM margining
- Still some manual processes involved in margining and allocation
- Lack of workflow and exception handling around the collateral pledging/receiving process
- Difficulty processing high trading volumes or in times of market stress
- Higher costs through lack of collateral cost allocation and optimisation

Advanced: Score Between 51-75

The advanced level sees a more automated and workflow-based approach to collateral management. There is a high level of STP and alerts/exception handling around key tasks to support operational processes.

The pledging and receipt of collateral is almost completely automated, ensuring the firm does not breach its own or its counterparties' risk guidelines. The time spent by collateral managers dealing with manual processes is reduced significantly, allowing a greater focus on risk and collateral cost control.

It allows collateral managers to forecast possible collateral requirements more easily and deal with market volatility in a more proactive way. It allows the firm to pledge and receive both cash and non-cash collateral. It also incorporates the assignment of costs to collateral assets, paving the way for collateral optimisation.

Benefits

- Can cope with high trading volumes

- Reduced credit, liquidity, market, concentration and operational risk

- Frees up time spent on operational processes

- Exception handling and alerts on process failure

- Allows collateral managers to focus on managing risks and exceptions

- Minimal manual intervention

- Supports business growth with minimal increase in headcount

- Allows the firm to widen the range of collateral types, exposures and counterparties

- Some ability to forecast collateral needs

- Some ranking of collateral priority and pledging rules

Risks/Costs

- Unnecessary pledging of expensive collateral

- Misses the full cost reduction benefits of collateral optimisation

- Unable to fully identify opportunities for yield enhancement on collateral holdings

- No stress testing of the portfolio to simulate market shocks

Optimised: Score Between 76-100

If you have reached the higher level scores, your collateral processes and systems are at the cutting edge of best practice. The optimised level allows the firm to meet all of the key criteria of:

1. Mitigating the various types of risk

2. Reducing manual effort and minimising headcount

3. Supporting business growth

4. Optimising costs and increasing the range of opportunities available

It allows collateral managers to be more proactive and forward-looking in their approach to collateral demands. It also enables the firm to achieve an integrated liquidity management function to manage liquidity risk and meet regulatory requirements such as the Basel III LCR and NSFR, where applicable.

A robust stress testing methodology with the ability to run what-if scenario analysis allows the collateral/liquidity manager to pre-empt the effects of market disruption on the collateral book.

This approach sees collateral management as a similar discipline to asset and liability management, using software tools to predict future collateral needs and liquidity gaps wherever possible. The collateral desk can then help to meet these needs with the lowest cost assets, based on factors such as forward views of rates.

When fully optimised, the consolidation of derivatives collateral management with the securities lending and repo desks can enable the firm to think proactively about obtaining low cost collateral assets via a natural flow of trading activities to meet its needs.

This will become more important when developed markets being to enter a rising rate environment as quantitative easing comes to an end and tapering programs begin.

The Optimised model also allows the firm to treat the collateral portfolio as a profit centre. The calculation of the opportunity costs of deploying collateral assets in a given way allows significant cost reductions, while also maximising the financing opportunities in the collateral portfolio.

It avoids unencumbered assets sitting idle on the balance sheet and can start to incorporate collateral usage as a balance sheet management tool.

Next Steps

While there are significant benefits to reaching a fully optimised operating model, for many firms, performing the basic collateral automation and optimisation tasks can provide many of the key cost saving benefits. It is also imperative to put the initial building blocks covered in the earlier stages of the healthcheck in place before true optimisation can be achieved.

It is also useful to identify the low hanging fruit and activities that will generate the best ROI as there is often a diminishing return on investment for some of the more advanced optimisation tasks.

The degree of effort vs return on investment for each activity should be carefully considered and is specific to each firm, the size and make up of its collateral portfolio, its risk appetite and its IT footprint.

4sight offers consultancy around improving collateral management and collateral optimisation processes. Since our formation in 2003, we have worked with a wide range of clients across the buy side and sell side including some of the world's most well-known broker/dealers, agent lenders, asset managers and custodians.

Many of these consultancy engagements have involved large-scale, complex, multi-site global projects. 4sight therefore has a wealth of expertise in defining optimal collateral operating models, coupled with highly experienced consultants, many of whom have worked in banks themselves.

For a free consultation with one of our collateral business experts to discuss the results of your healthcheck in more detail, please contact us or email ms@4sight.com

About 4sight Financial Software

4sight Financial Software is an independent provider of software solutions and consultancy with nineteen years of experience and offices and clients worldwide. 4sight's customer base includes a full spectrum of buyside and sellside market participants, from smaller banks, asset managers, buy side firms and custodians through to global broker dealers.

Clients in sixteen countries on four continents use 4sight's software to meet their business needs and 4sight offers the reliability and experience of a company with a proven track-record.

The 4sight Collateral Management system provides an enterprise-wide, cross-product collateral management and optimization solution for securities lending, repo, OTC/exchange-traded derivatives and CCP collateral. 4sight's product range also includes solutions for settlement and market connectivity.

In addition to software development, 4sight provides project management, consultancy services and customer support through its global network of offices.

For further details, please visit: www.4sight.com

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In his 10 years at 4sight, he has specialised in securities lending, repo and OTC/listed derivatives collateral management.

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