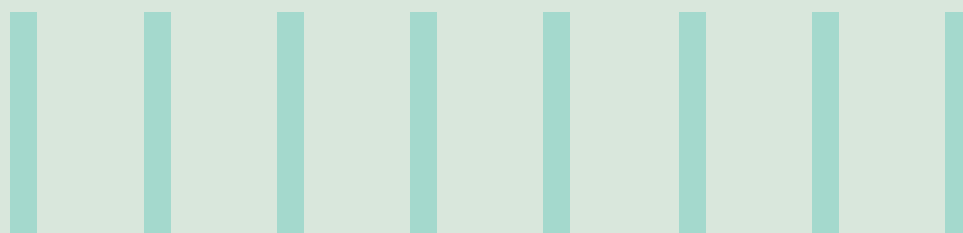




# COLLATERAL MANAGEMENT - CHANGES IN A POST-CRISIS WORLD

Vikranth Gorantla, Vinayak Holmukhe



## Abstract

In an evolving regulatory landscape, there has been a surge in collateral requirements. In response, financial market participants are tweaking their collateral management systems to meet new emerging collateral requirements. This paper outlines the changes participants are making and the advancements in collateral management. It also analyzes the advancements and their repercussions, and recommends steps to transform to a new and more efficient collateral management setup.

## Collateralization in the pre-crisis era

One of the main reasons for systemic risk accumulation during the 2008 financial crisis was insufficient collateralization and an inability to adjust the decline in collateral value regularly. Collateralization was predominantly a back-office function before the crisis as it was not considered a major trade profitability factor. Collateral choice was also not a major concern as the

counterparty could post available collateral meeting the criteria specified in the Credit Support Annexure (CSA) and CSA offers several collateral options – cash, treasury bonds, corporate bonds in different currencies at different haircuts. Quality never received much importance while posting collateral. Additionally, not every trade was collateralized, only ones where

banks perceived the counterparty had a high risk of default.

Collateral was maintained and managed by the respective trading desks of banks with corresponding custodians and no firm-wide visibility. Custodians differed across different jurisdictions or entities or even desks of the same entities and were managed as individual silos.

## Post-crisis: Regulations driving collateral demand

### Collateral requirements for centrally cleared transactions

Post crisis, intending to reform the OTC derivatives trading environment, various regulations such as Dodd-Frank Act, EMIR, Basel, etc., mandated all standardized trades to be cleared through central counterparties (CCPs). And for a trade to be centrally cleared both counterparties must post the initial margin and subsequently, the variation margin regularly depending on the margin calls received. CCPs expect highly liquid and high quality collateral in the form of cash or cash equivalent assets which come at high cost. In addition, as one CCP may not have the capabilities to clear trades of all asset classes, counterparties may need to clear

their trades through different CCPs for different asset classes thereby losing the counterparty level netting benefits associated with trading different asset classes with the same counterparty. Every CCP may mandate individual margin requirement driven by proprietary margin calculation methodology. This means more uncertainty and increased collateral requirements for the counterparties in a centrally cleared world.

### Collateral requirements for bilateral transactions

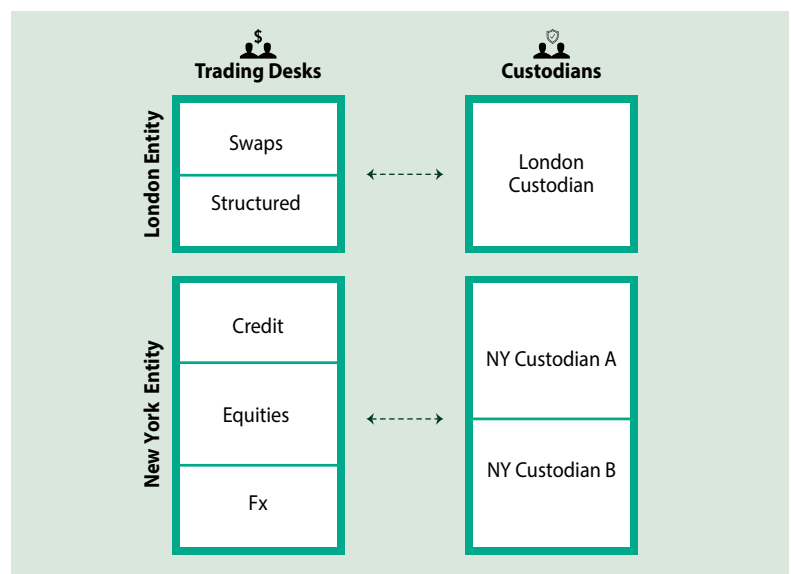
With an aim to move bilateral trades to CCPs, regulators are taking punitive measures on bilateral trades by imposing stringent margin and collateral

requirements for non-centrally cleared trades and subjecting bilateral trades to initial and variation margin requirements. The variation margin is intended to cover current exposure which is equivalent to the daily mark-to-market of the trade and the initial margin is intended to cover potential future exposure. In addition, initial margin must be posted by both parties without any netting benefits associated and a provision must be made to ensure that the margin amount is utilized to compensate only one counterparty, in case the other party defaults. It must also protect the margin so that the margin giver is not impacted in case the receiver defaults.

## Challenges in meeting collateral demand

### Collateral fragmentation in the organization

In the past, collaterals were managed in silos by custodians of respective trading desks with no visibility to other trading desks or entities. Therefore, any unused collateral available with one desk could not be used by any other trading desk. Instead, the desk falling short would procure it from outside. Managing collateral this way posed challenges in meeting impending collateral demand.

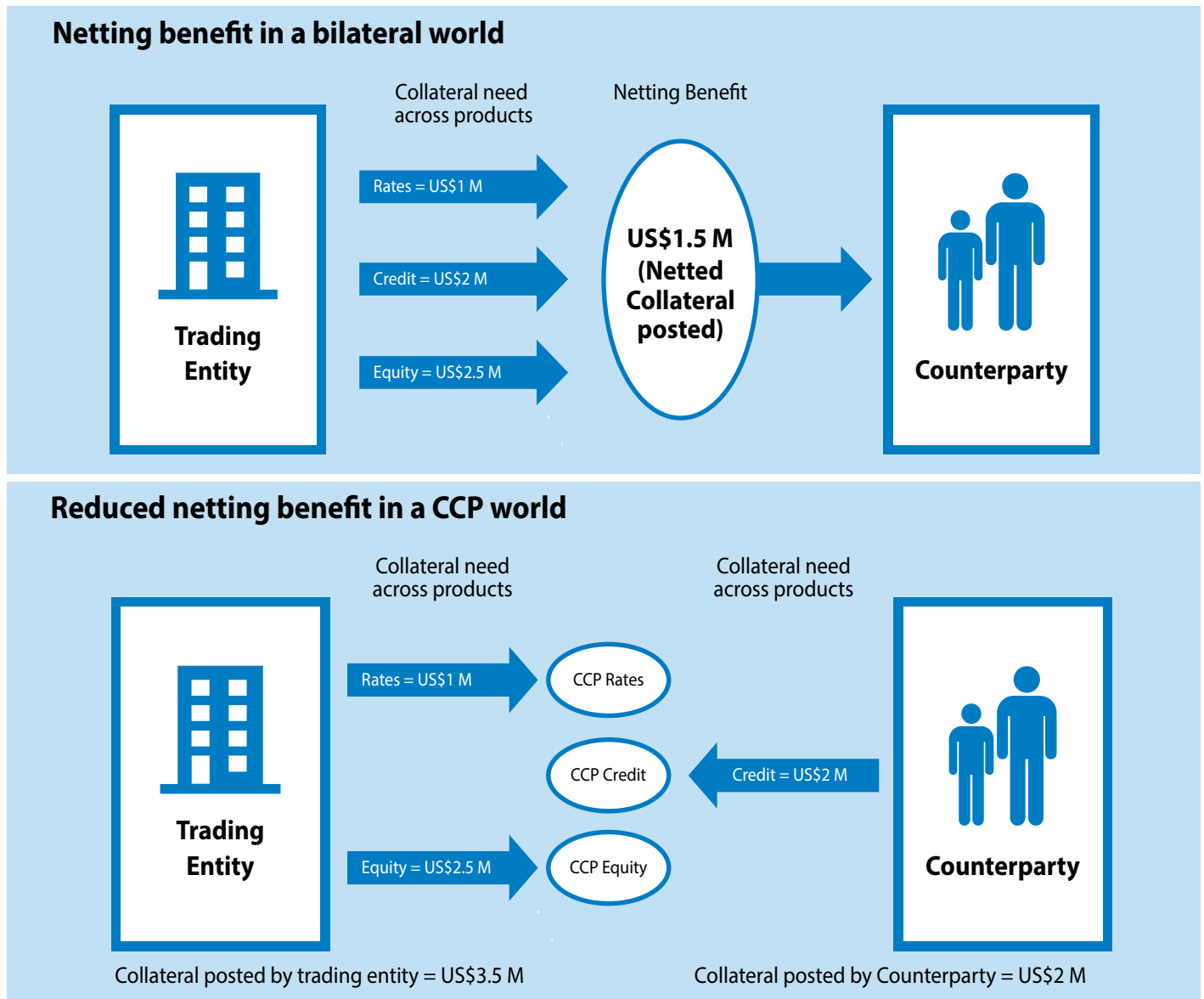


## Collateral demand fragmentation at the CCP level

Traditionally being bilateral, OTC derivative trades were collateralized based on the CSAs entered into with the respective counterparties. These CSAs offered options on the kind of collateral to be posted in terms of currencies, type of securities, etc.,

and had the netting benefits for posting collateral at the multi-product portfolio level with the counterparties. But with the advent of CCPs and regulators mandating standardized trades clearing through CCPs, these netting benefits have reduced

drastically. Trades now get cleared through different CCPs as not every CCP clears the trades of every product. This creates fragmented collateral requirements across multiple CCPs to cover individual, daily, and even intraday margin calls.



### Collateral shortage

A study by the Bank of England in 2012 estimated that new collateral requirements as a result of regulatory mandates could be as high as US\$800 B (Source: Financial Stability Paper No. 18 – October 2012. OTC derivatives reform and collateral demand impact). Studies by other research firms have forecast much more than this – in

the order of US\$1–1.5 trillion dollars attributing to regulatory mandates, liquidity requirements, central clearing of OTC derivatives, and increased capital requirements for non-cleared derivatives. In addition, clearing houses impose initial margin requirements and reduce or remove the thresholds for variation

margin leading to increased demand for high quality collateral.

While there is apparently a huge increase in collateral demand, the supply may be very limited as not all financial institutions are able to optimize and mobilize their available collateral to meet demand. This could create a huge collateral shortage in the future.

## Limits on collateral reuse

Collateral reuse and rehypothecation would be restrained not only due to regulations limiting reuse of collateral by CCPs in central clearing and limiting rehypothecation of initial margins in bilaterally cleared transactions, but also because of the perceived risks by counterparties. In fact, even Liquidity Coverage Ratio (LCR) would restrain rehypothecation as only unencumbered assets are eligible as high-quality liquid assets and assets used in rehypothecation do not qualify as unencumbered assets.

## Advancements in collateral management and the perceived risks

In response to the increased collateral requirements, financial institutions are adopting ways to manage their collateral supply more efficiently to meet the perceived demand. They are following a two-pronged approach – firstly, create a centralized view of the collateral in the firm by removing fragmentation, and secondly, optimize the collateral based on the requirement and availability.

### Centralization

As collateral fragmentation on the demand side is not in their control, firms are looking for ways to overcome it at least in the supply side. Institutions are moving towards a 'hub and spoke' model

by creating a collateral hub interfacing all the trading desks of the legal entities of the institution and all the custodians currently maintaining collateral of the respective desks. A collateral hub is intended to aggregate collateral across all custodians to provide a centralized view of the available collateral across the firm. Each custodian shares the available collateral information with the hub and receives instructions for the movement of collateral with it to be placed with the bilateral or CCPs. In addition, each trading desk receives a consolidated view of collateral from the hub and sends instructions back for collateral movement from a specific custodian to be placed with its bilateral

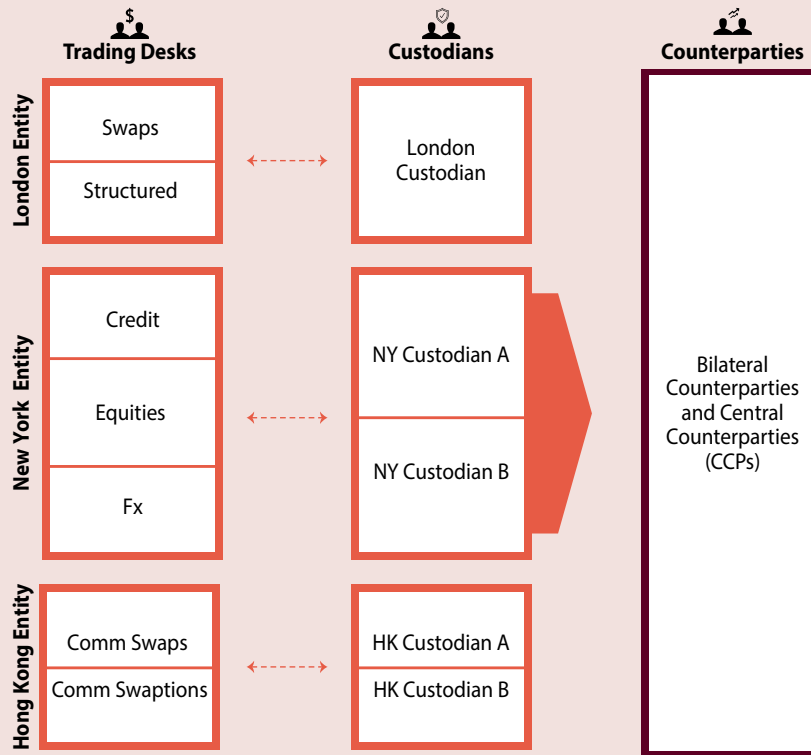
or CCP. This results in efficient collateral allocation by moving securities from desks with an oversupply to desks with an undersupply. In turn, this ensures that the custodians first look internally and then at external sources for collaterals.

Of course, the hub would need to incorporate security control features by providing only authorized accesses as some legal entities would be unwilling to disclose their information to other entities. Additionally, for cross-border mobility, the hub needs to factor in the jurisdiction specific tax and accounting and legal aspects to ensure that the cross-border collateral movements are compliant with laws of the respective jurisdictions.

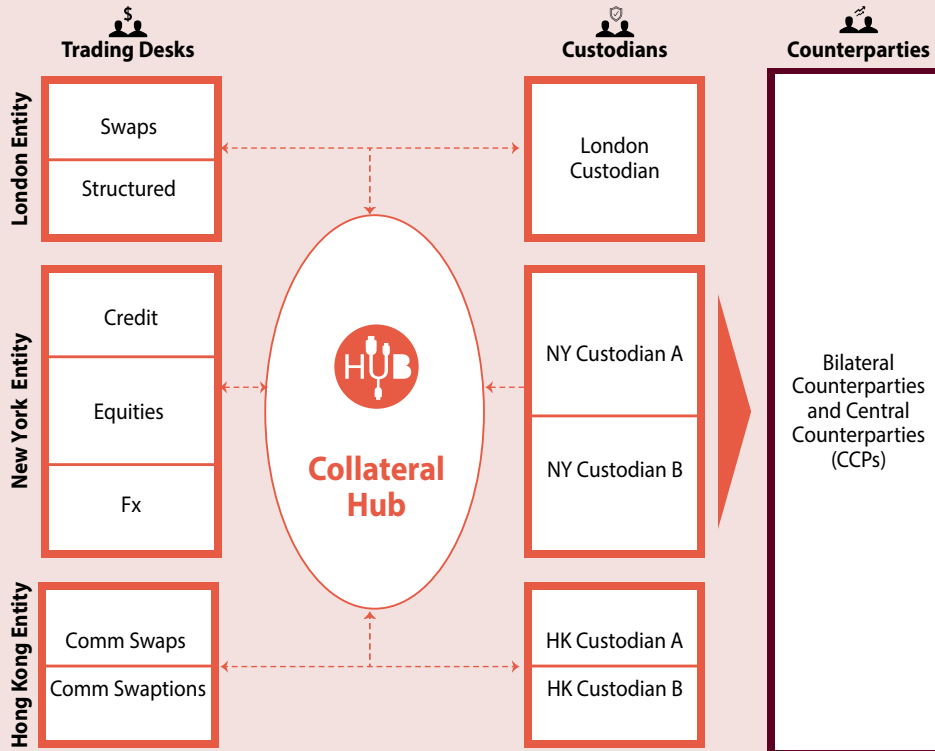


Here is a representation of the existing collateral setup (traditional model) and the hub and spoke solution:

## Traditional Model



## Hub and Spoke Model



## Collateral optimization

Once a centralized view of the available collateral is established, the next step is to find the most optimal collateral to be deployed to meet the demand.

Erstwhile, all individual desks or entities had individual siloed collateral management processes with proprietary algorithms to identify the cheapest custodian / desk to deliver collateral from the available asset pool and conforming to the margin or collateral requirements of CCPs or bilateral CSAs. Now, with the industry moving towards the hub and spoke model, the respective desks may have to rejig their collateral management processes by merging with the hub

services. The cheapest custodian / desk to deliver collateral will need to be identified from the entire accessible assets pool through the hub.

Obviously, the cheapest custodian / desk to deliver collateral may not necessarily be the optimal one. There might be situations where securities sourced from outside may turn out to be the most optimal one. In such cases, the available collateral can be exchanged with an external counterparty to get the optimal collateral to be deployed. The collateral hub and spoke solution can be further strengthened to not only provide a centralized view but based on the available collateral pool with the firm, recommend existing collateral

*The collateral 'hub and spoke' solution can be strengthened further to not only provide a centralized view but based on the available collateral pool with the firm, recommend existing collateral transformation by exchanging it with another counterparty in the market to get the best available collateral that can be most optimally deployed.*

transformation by exchanging it with another counterparty in the market to get the best available collateral that can be most optimally deployed.

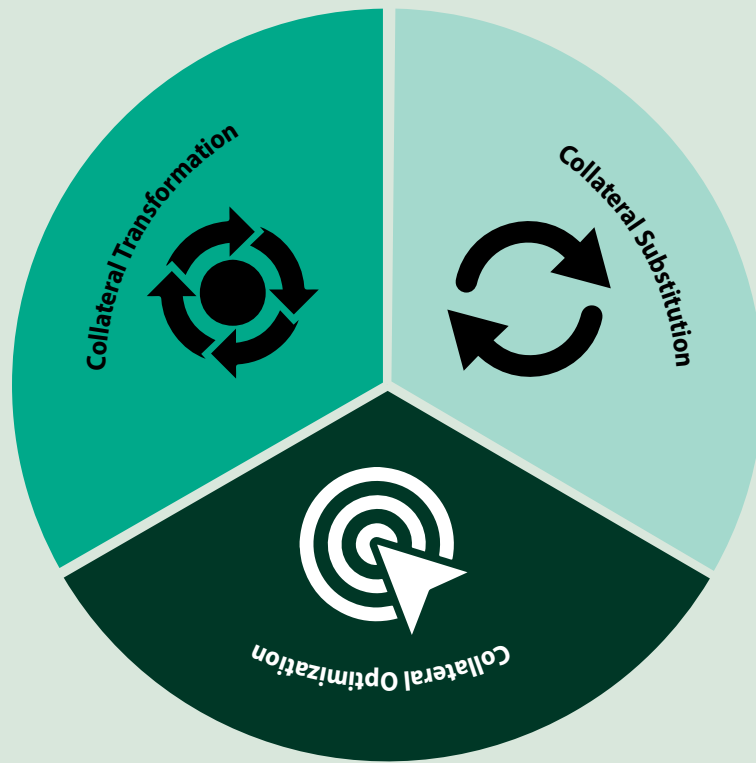
## Collateral Transformation



Collateral transformation where the counterparty short of the needed collateral may exchange the available securities that may be of lower quality with another counterparty to procure the required higher quality collateral or cash to buy the required collateral from the market has been around for some time. If, as predicted, there is a collateral shortage in the future,

then collateral transformation would become a highly sought-after service. What's more, if the yield curve turns steep, then market participants will have less incentive to hold liquid collateral. In such a case, collateral transformation may help procure high liquid collateral. Collateral hub can consider recommending transformations based on the perceived shortfall.

Collateral optimization also leads to collateral substitution where the collateral giver can choose to replace the existing collateral with cheaper collateral, as and when it becomes available and if it meets the taker's collateral criteria.



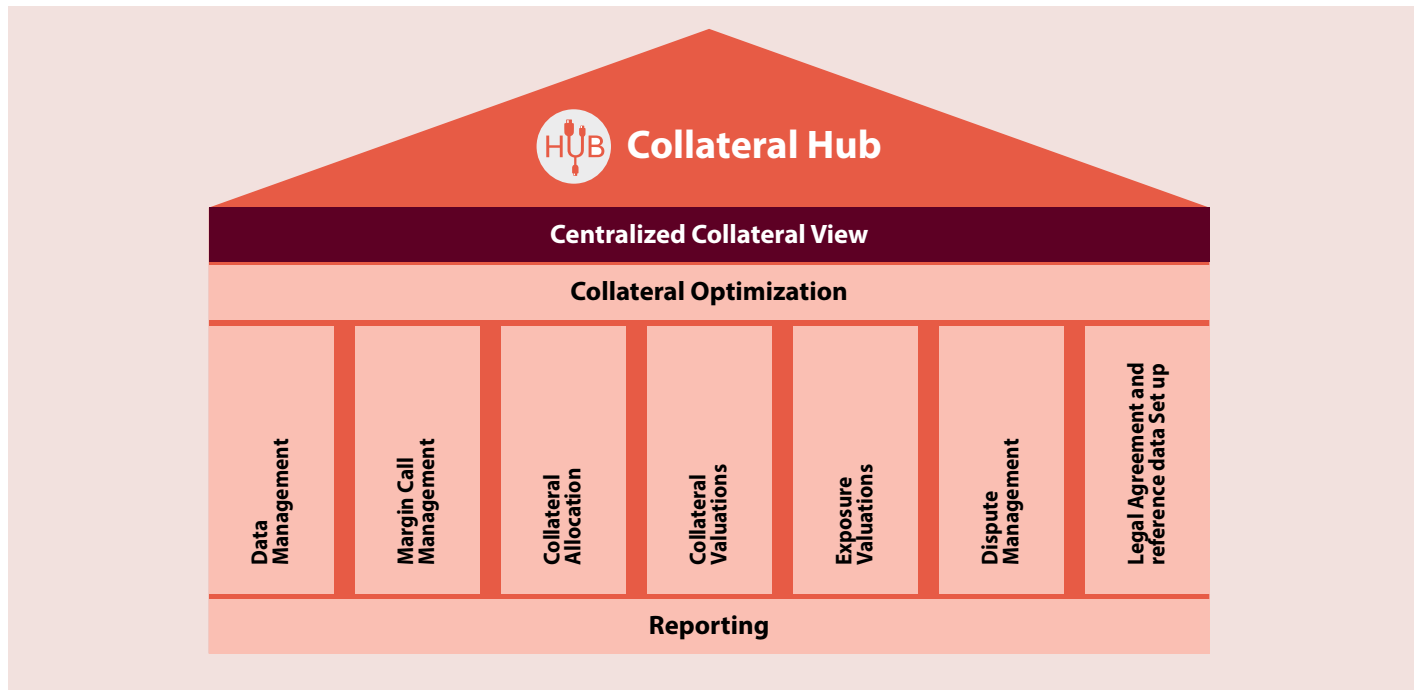
## Centralized collateral function

The collateral hub could be tuned further to not just provide a centralized view but also replace individual collateral management functions of respective desks or entities with a centralized collateral management function incorporating all

individual functions. This could profoundly enhance the enterprise collateral management operational efficacy.

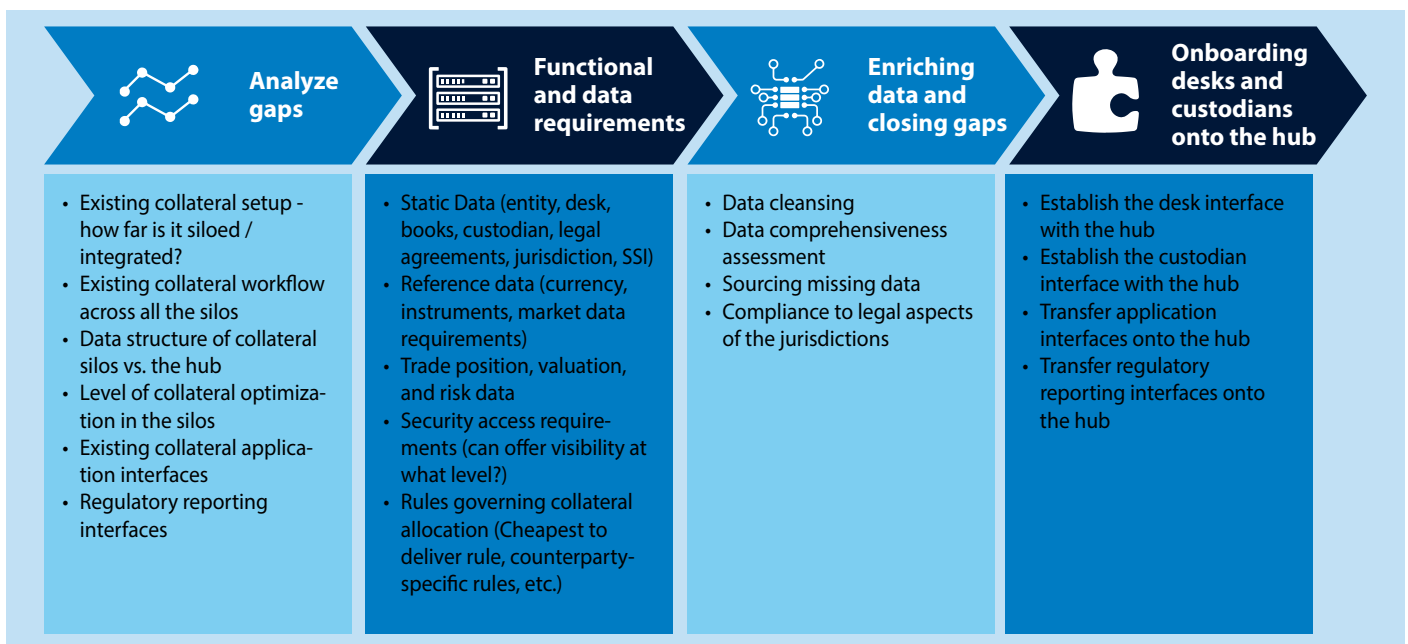
Here's an enterprise view of collateral management (collateral hub)

encompassing centralized collateral view, collateral optimization, and all essential functions of a collateral management system including reporting:



## Implementation: Transitioning to the collateral hub

Collateral hub and spoke model can be developed in-house or outsourced to a third-party. But smooth transition from the existing collateral management setup calls for a foolproof implementation. Here's an organized implementation approach:





## SWOT analysis of the collateral hub and spoke model

A careful analysis of the collateral hub and spoke model helps ascertain the key benefits, associated risks, and if the benefits surpass the costs. A sound planning helps overcome weaknesses and mitigate risks inherent in the solution

### Strengths



- Offers a centralized view of the available collateral by aggregating across custodians
- Collateral optimization helps determine the cheapest custodian / desk to deliver the collateral
- Collateral transformation helps the trading desk needing the collateral to exchange the available securities with another party to procure the required higher quality collateral
- Collateral substitution would only supplement collateral optimization by helping replace the posted collateral with a cheaper collateral, as and when it becomes available

### Weaknesses



- Increased linkages across various financial utilities may pose technology challenges in implementation and maintenance
- Centralized view across different geographies with considerable time difference could be a challenge
- Cross-border collateral movements may have various legal and tax implications which need to be factored in
- High implementation and operational costs involved means a cost benefit analysis must be carried out to evaluate the potential business benefits
- With time, collateral hub and optimization services would make the trading desks over-dependent on them leaving them unprepared for any service operational failures

### Opportunities



- Centralized view leading to efficient collateral allocation may help firms reduce their collateral reserves and use them for other business opportunities
- Firms can become robust and expand into markets where they currently have a low presence
- Opportunities for big banks to become market makers in collateral management by offering collateral transformation trading products for customers to exchange their existing collateral
- Benefit of reduced CVA for collateralized trades can be further augmented through collateral optimization
- As collateral optimization can have a direct impact on trade prices, it can become a major differentiator. Firms can offer best quotes to their clients, increase trader's commissions and thereby increase overall sales.

### Threats



- Although the advancements help in efficient collateral allocation, the operational risks they bring in during periods of stress may lead to missing margin calls and pose systemic risks
- As collateral optimization always results in CTD collateral, the collateral receiver would accumulate high concentrations of low quality collateral resulting in increased concentration risks
- Collateral optimization leads to increased collateral substitution creating collateral uncertainty for takers
- Collateral transformation may lead to forceful termination of main trade, if collateral is unable to be sourced upon the termination of the transformation trade and if both the trades have differing maturities
- Cross-border collateral movements may pose legal risks if laws pertaining to securities movements and disputes resolution of the jurisdictions are not thoroughly understood



## In a nutshell

Although there are perceived weaknesses and risks associated with a collateral hub and spoke model, it is the best possible approach for increasing collateral management efficacy. Of course, the approach has to be supplemented with a robust technology infrastructure to overcome the perceived weaknesses and risks. As the regulatory landscape continues to evolve, the collateral hub solution must be technologically scalable to accommodate changes. Based on the existing state of collateral management, every financial institution needs to deliberate on whether an external vendor or internally built solution is suitable. Strategic partnership with the right technology vendor for development, implementation, and maintenance of the solution would help achieve quicker time-to-market, ensure the benefits outdo the associated costs, and streamline the complete collateral management operation.

## About the Authors



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Vikranth has over ten years of professional experience and is a part of Risk & Compliance practice within Financial Services vertical in Infosys. He is a B.Tech from Indian Institute of Technology, Kanpur, and an MBA in Finance from The University of Hong Kong. His functional experience is into Business Analysis, and Project Management. Vikranth has worked majorly on Pricing, Risk, and Compliance, for leading clients, in the Investment Banking & Capital Markets space and has also worked on the regulatory initiatives like Dodd-Frank mandated SDR reporting for OTC IR derivatives.



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Vinayak is working as a Lead Consultant in Infosys Capital Markets practice and has over ten years of overall IT experience and seven years in the finance domain. He has good exposure to OTC Front and Back office systems and has a good understanding of the regulatory areas like EMIR & MAS.

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