Case Study
Liability-Driven Investing

February 2021

The DB End Game — Helping Schemes Prepare for the Finish Line

Recent years have seen trustees and corporate sponsors of defined benefit (DB) schemes explore ways of managing and reducing risks as they meet their obligations to members. We discussed the routes available in our paper, **'Demystifying the DB End Game'.**

As a leading global fixed income manager, State Street Global Advisors can offer clients the full range of derisking capabilities, including liability-driven (LDI) and cashflow-driven (CDI) investment and Target Leverage Funds.

Here, we present three hypothetical case studies showing how we could help our clients reach a stronger position on their end game journey. The three DB schemes outlined start with different challenges, but could ultimately achieve more certainty over their scheme risks and cashflows requirements.

The solutions we could provide all include LDI strategies to better match inflation and interest rate risks, while using leverage to free up assets to be invested elsewhere. The strategies also involve CDI allocations that help meet scheme payments to members without the need to become forced sellers of assets in volatile markets.

Summary

The case studies are stylised examples to illustrate the range of starting points that schemes may be at (with regard to scale, asset allocations, funding levels, covenants and other factors) and where they could potentially get to.

The ultimate goal is to better prepare them for their end game destination. In each case study, we explain how State Street Global Advisors could help the schemes improve their funding ratio (volatility) and better manage risks through LDI, CDI and improved asset allocation.

The table below summarises key details of our three hypothetical clients:

Client	Scheme Size (£bn)	Initial Funding Level (%)	Initial Interest Rate/ Inflation Hedge (%)	Scheme Aim
Widget PLC	0.3	75	21	Better match target liabilities
Techno PLC	1.8	95	50	De-risk and plan for buyout in 10 years
Blue Chip International PLC	8.0	90	60	De-risk using segregated LDI and CDI funds

The information contained above is for illustrative purposes only.

Widget

Widget is a mid-sized manufacturing company, with a significantly underfunded DB pension scheme and tending to weak sponsor covenant. Given the weak funding, the scheme does not yet have a clear end game.

Our solution would be to help Widget manage its scheme cashflow and liability risks by increasing diversification of scheme assets and increasing the scheme's hedge ratio.

Techno

Techno is the UK subsidiary of an international engineering group. The scheme is relatively well funded, and the covenant is tending to strong. The £1bn scheme fully closed in 2015 and the trustees are looking to de-risk, with the end goal being a buyout within 10 years.

Our solution would be to increase the scheme's hedge ratio, reduce risk and increase the cashflow certainty of the scheme.

Blue Chip International

Blue Chip is a large, multi-national manufacturing company with an £8bn DB scheme and a robust 90% funding level. The sponsor covenant is strong and the scheme aims for self-sufficiency. Blue Chip was interested in a portfolio that would better match its liabilities, but in a segregated fund format for LDI and CDI investments, that would sit alongside existing private markets investments.

Our solution would be to diversify Blue Chip's scheme asset allocation and increase the scheme's hedge ratio.

State Street Global Advisors has helped these pension schemes successfully prepare for their preferred end game leveraging our experienced asset allocation, LDI and CDI teams. We discuss each case study in more detail on the following pages and can provide more information upon request.

Scheme 1: Widget

Widget is a mid-sized manufacturing company, with a significantly underfunded DB pension scheme and tending to weak sponsor covenant. Widget's £300m scheme is 75% funded and had a traditional asset mix of multi-asset funds and gilts, no leverage and a low (c.20%) hedge to both interest rate risk and inflation risk.

After a full analysis of Widget's current portfolio, we would propose to increase the diversification of the scheme assets and to target an increase of the hedge ratio to 75%. In the short-term, we would also stabilise the cashflow shortfall through CDI. We utilise our Target Leverage Funds, a range of leveraged equity and LDI funds that can provide leverage to help fuel growth and tailor-match liabilities.

Figure 1a
Asset Allocation Changes

Asset	Current Allocation (%)	Solution Allocation (%)
Multi-Asset Fund	80	–
Long Glits	20	–
Leveraged LDI Funds	–	32
CDI Funds	–	10
Leveraged Equity Funds	–	11
Strategic Diversified Fund	–	47
Total	**100**	**100**

Source: State Street Global Advisors, as at 30 June 2020.

The table above summarises the asset allocation changes we would employ to improve Widget's funding level and manage its risks.

We helped manage Widget's scheme cashflow and liability risks through allocations to:

- Leveraged LDI funds to hedge risks
- Leveraged equity funds to preserve the return target
- Cashflow-driven investment (CDI) credit funds to improve the cashflow negative status

The leverage of the overall portfolio increased to 2.5x. The expected returns are maintained, the solution is now much better hedged and the funding ratio is less volatile.

Figure 1b

Widget's Initial LDI Portfolio: Interest Rate Hedge

- Target Liabilities
- Liabilities
- Unlevered Index Linked Gilt Index
- Unlevered Conventional Gilt Index

Matching Assets

Net Asset Value	£60m
Exposure	£60m
Leverage	1.0x

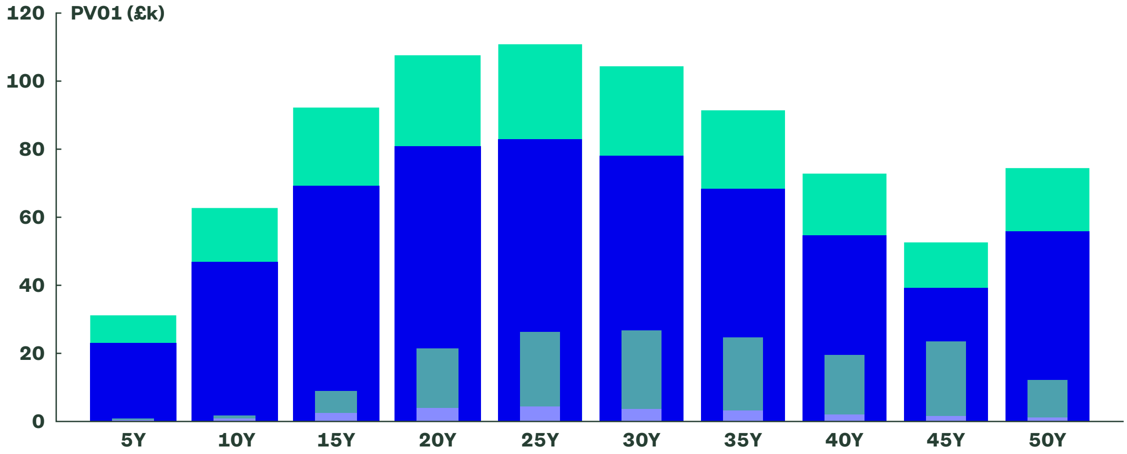
Liabilities

Present Value	£400m
Total PV01 (£k)	800
Total IE01 (£k)	625

Interest Rate Hedge

Target Hedge Ratio	75%
Achieved Hedge Ratio	21%

Target Liabilities PV01 (£k)	600
Achieved Assets PV01 (£k)	166



Source: State Street Global Advisors, as at 30 June 2020. Please note this does not account for holdings of UK government bonds in the multi-asset fund.

The chart above shows that the initial gilt portfolio (in light blue and purple) was doing a poor job of matching the target liabilities (in dark blue). The green bars are the scheme liabilities.

Figure 1c

Our Solution: Improved Interest Rate Hedge

- Target Liabilities
- Liabilities
- Target Leverage Fund (LDI Funds)
- CDI Funds

Matching Assets

Net Asset Value	£125m
Exposure	£315m
Leverage	2.5x

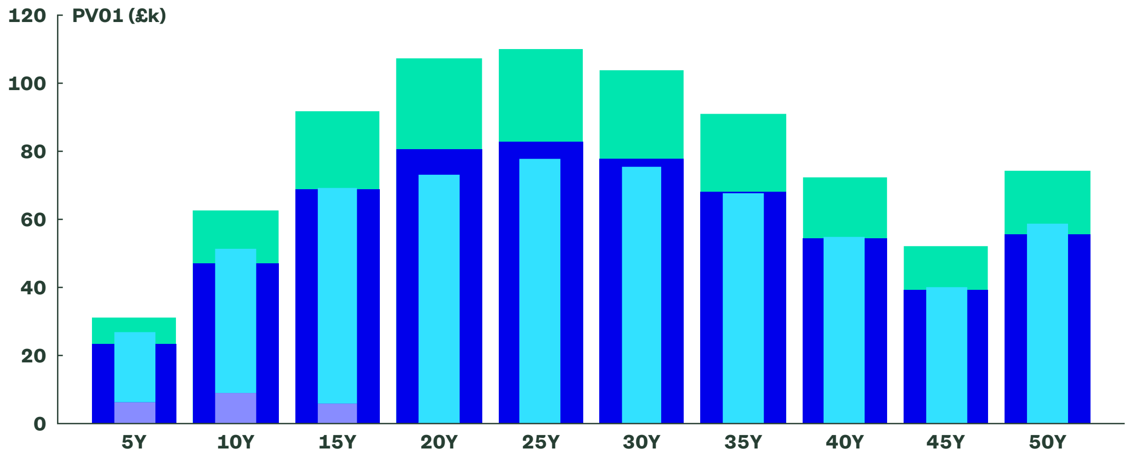
Liabilities

Present Value	£400m
Total PV01 (£k)	800
Total IE01 (£k)	625

Interest Rate Hedge

Target Hedge Ratio	75%
Achieved Hedge Ratio	75%

Target Liabilities PV01 (£k)	600
Achieved Assets PV01 (£k)	600



Source: State Street Global Advisors, as at 30 June 2020.

Here, the solution allocation (light blue and purple bars) much more closely matches the target liabilities (dark blue bars).

Scheme 2: Techno

Techno is the UK subsidiary of an international engineering group. Techno had a strong initial funding level of 95% and we would work with the client to lock down its funding level position, in light of volatile market conditions.

The initial portfolio consisted of an approximately equal proportion of UK equities, corporate bonds and index-linked gilts, and 10% in illiquid property. Our solution is to increase the scheme's hedge ratio from 50% to 95% and reduce risk, while utilising a CDI approach to increase the cashflow certainty of the scheme.

We would chose a pooled solution for simplicity and used our DB+ implementation service to help the trustee with funding level triggers. The DB+ service dramatically reduces administrative burden from initial implementation through managing the portfolio all the way to handling a scheme's cashflows.

We would implement the following asset allocation changes, with the constraint to maintain the 10% allocation to illiquid property to avoid incurring high trading costs.

Figure 2a
Asset Allocation Changes

Asset	Current Allocation (%)	Solution Allocation (%)
Equities	30.0	–
Property	10.0	10.0
Corporate Bonds	27.5	–
Index-Linked Gilts	32.5	–
Leveraged LDI Funds	–	17.6
Unleveraged LDI Funds	–	22.4
CDI Funds	–	40.0
Leveraged Equity Funds	–	10.0
Total	**100**	**100**

Source: State Street Global Advisors, as at 30 June 2020.

The solution allocation for Techno involves reallocating away from equities, corporate bonds and index-linked gilts to:

- Leveraged LDI funds to hedge risks
- Unleveraged LDI funds also to hedge risks
- CDI credit funds to improve the cashflow negative status.
- Leveraged global equity funds to preserve some of the return and to add diversification

The expected return of the portfolio is somewhat reduced, but overall risks are better matched.

Figure 2b

Techno's Initial LDI Portfolio: Interest Rate Hedge

- Target Liabilities
- Liabilities
- Unlevered Index Linked Gilt
- Corporate Bonds

Matching Assets

Net Asset Value	£600m
Exposure	£600m
Leverage	1.0x

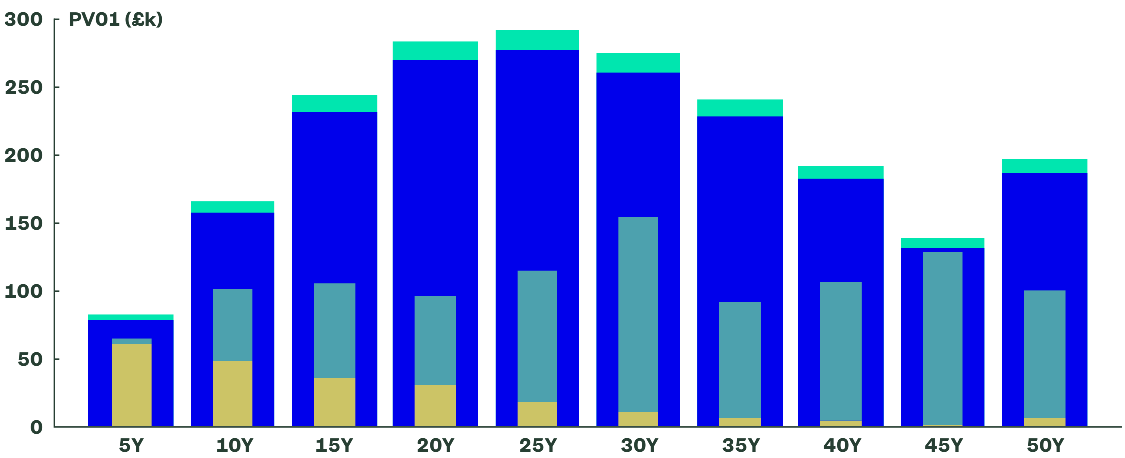
Liabilities

Present Value	£1,053m
Total PV01 (£k)	2,106
Total IE01 (£k)	1,646

Interest Rate Hedge

Target Hedge Ratio	95%
Achieved Hedge Ratio	50%

Target Liabilities PV01 (£k)	2,001
Achieved Assets PV01 (£k)	1,062



Source: State Street Global Advisors, as at 30 June 2020.

Figure 2c

Our Solution: Improved Interest Rate Hedge

- Target Liabilities
- Liabilities
- Target Leverage Funds (LDI Funds)
- Unlevered Index Linked Gilt Index
- CDI Funds

Matching Assets

Net Asset Value	£800m
Exposure	£1,236m
Leverage	1.5x

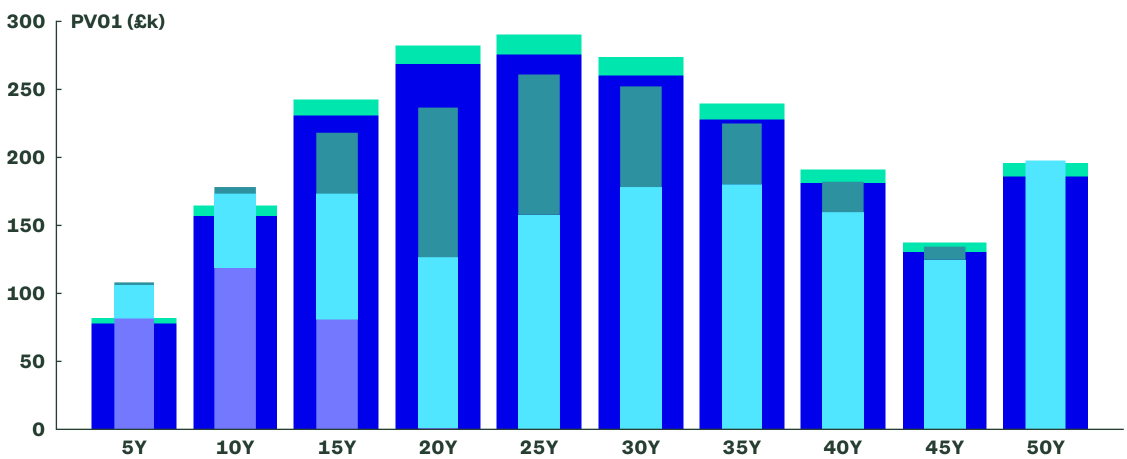
Liabilities

Present Value	£1,053m
Total PV01 (£k)	2,106
Total IE01 (£k)	1,646

Interest Rate Hedge

Target Hedge Ratio	95%
Achieved Hedge Ratio	95%

Target Liabilities PV01 (£k)	2,001
Achieved Assets PV01 (£k)	2,001



Source: State Street Global Advisors, as at 30 June 2020.

Scheme 3: Blue Chip International

Blue Chip is a large, multi-national manufacturing company with an £8bn DB scheme and a robust 90% funding level.

Initially, the Blue Chip scheme invested in a diversified portfolio of equities, corporate bonds, unleveraged gilts and illiquid assets and i only 60% hedged. Our aim is to diversify the scheme's asset allocation and increase the hedge ratio from 60% to 90%.

We would implement the following asset allocation changes:

Figure 3a
Asset Allocation Changes

Asset	Current Allocation (%)	Solution Allocation (%)
Equities		
– MSCI ACWI	30	10.0
– Multi Factor ESG	–	10.0
– Emerging Markets	–	5.0
Property	5	5.0
Private Equity	5	5.0
Infrastructure	5	5.0
Corporate Bonds	15	–
EM Sovereign Bonds (LC)	–	5.0
Glits (Unleveraged)	40	–
Glits (Leveraged)	–	21.6
CDI	–	33.4
Total	**100**	**100**

Source: State Street Global Advisors, as at 30 June 2020.

The solution for Blue Chip involves reducing the allocation to global equities and removing unleveraged gilts in favour of:

- A diversified ESG multi-factor strategy to target long-term outperformance and to improve the portfolio's ESG and carbon footprint characteristics
- Emerging market equities to target long-term outperformance
- CDI credit funds to improve the cashflow negative status
- Leveraged gilts to hedge risks and boost returns
- Emerging market sovereign bonds to target long-term outperformance

Compared to the initial allocation, the solution allocation has a marginally lower expected return. As with Techno, Blue Chip accepts this as it wanted to better match its liabilities and retain its allocation to illiquid assets (property, private equity and infrastructure) to avoid incurring transaction costs.

Figure 3b
Blue Chip's Initial LDI Portfolio: Interest Rate Hedge

- Target Liabilities
- Liabilities
- Unlevered Index Linked Gilt Index
- Corporate Bonds

Matching Assets

Net Asset Value	£4,400m
Exposure	£4,400m
Leverage	1.0x

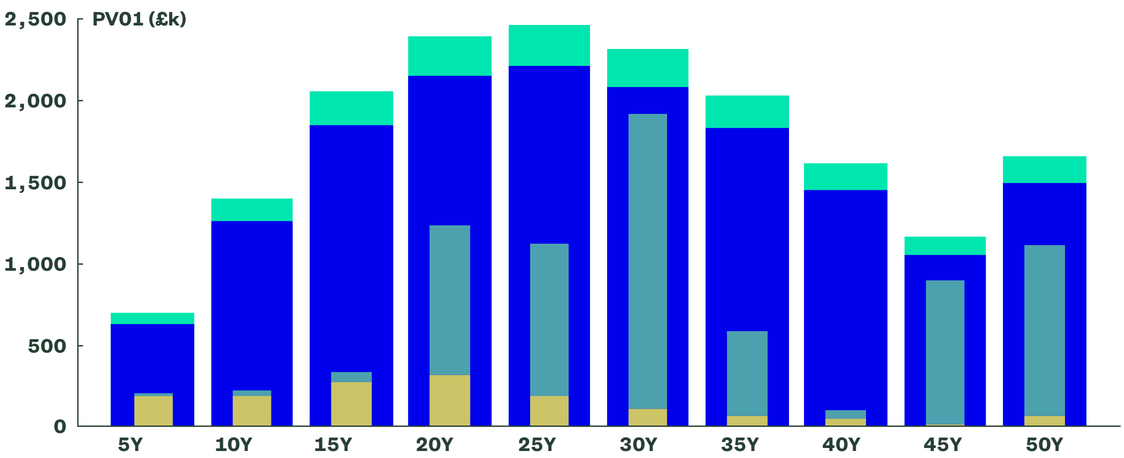
Liabilities

Present Value	£8,887m
Total PV01 (£k)	17,778
Total IE01 (£k)	13,891

Interest Rate Hedge

Target Hedge Ratio	90%
Achieved Hedge Ratio	60%

Target Liabilities PV01 (£k)	16,000
Achieved Assets PV01 (£k)	10,733



Source: State Street Global Advisors, as at 30 June 2020.

Figure 3c
Our Solution: Improved Interest Rate Hedge

- Target Liabilities
- Liabilities
- Repo Glits
- Physical Glits
- CDI Funds

Matching Assets

Net Asset Value	£4,400m
Exposure	£8,729m
Leverage	2.0x

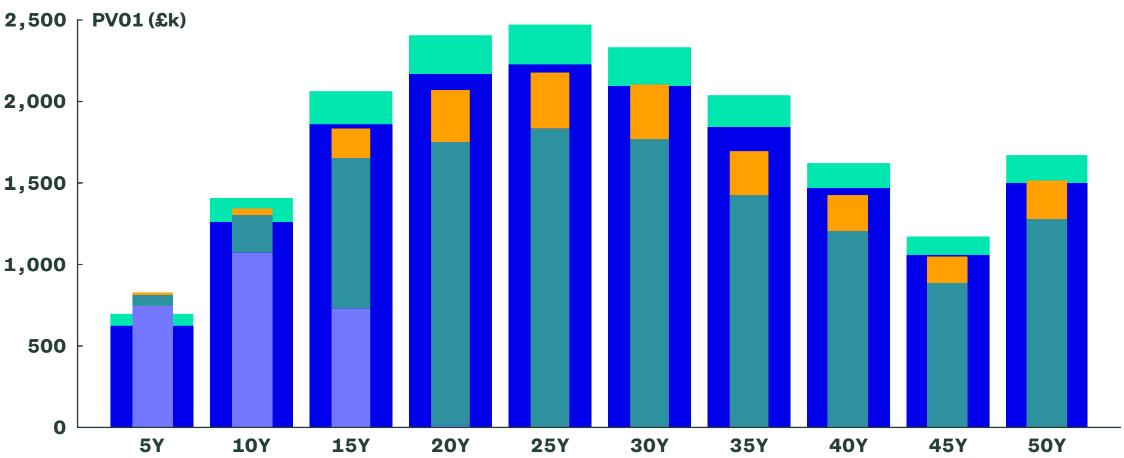
Liabilities

Present Value	£8,887m
Total PV01 (£k)	17,778
Total IE01 (£k)	13,891

Interest Rate Hedge

Target Hedge Ratio	90%
Achieved Hedge Ratio	90%

Target Liabilities PV01 (£k)	16,000
Achieved Assets PV01 (£k)	16,000



Source: State Street Global Advisors, as at 30 June 2020.

Conclusion

Our teams are able to assess the efficiency of current investments and look for solutions that will help you better manage risks and meet your scheme objectives. We would be delighted to consider the challenges for your scheme and discuss how our strategies can help your end game journey and deliver good outcomes to your members.

State Street Global Advisors Target Leverage Funds

We developed our Target Leverage Funds to address each of the main aims that schemes have: capital and collateral efficiency, and allocational flexibility. The Target Leverage Funds are a powerful range of leveraged equity and LDI funds that can provide clients of 3x leverage — helping to fuel growth and tailor-match liabilities.

The leverage in our Funds gives capital efficiency because it helps to free up capital that can be used elsewhere by a scheme, for example, to pay benefits, increase diversification or to allocate to other growth, income or hedging assets.

Our innovative Efficient Collateral Pool provides low-friction and daily movement of collateral between the Pool, and the LDI and Equity Target Leverage Funds.

Our Target Leverage Funds allow schemes to choose different exposures to suit their individual requirements and give them the ability to easily adjust their allocations when scheme circumstances change.

Equity Funds (4 Times Leverage)

- State Street Target Leverage UK Equity Fund
- State Street Target Leverage World Equity Fund
- State Street Target Leverage World Equity Hedged Fund

LDI Funds (5 Times Leverage)

- State Street Target Leverage Nominal Rate Short LDI Fund
- State Street Target Leverage Nominal Rate Long LDI Fund
- State Street Target Leverage Real Rate Short LDI Fund
- State Street Target Leverage Real Rate Long LDI Fund

Cashflow-Driven Investment

- State Street CDI Credit Fund 2021–2025
- State Street CDI Credit Fund 2026–2030
- State Street CDI Credit Fund 2031–2035

Our CDI approach is a systematic buy and maintain strategy implemented on a global corporate bond universe aiming to deliver reliable cashflows to meet a pension scheme's outgoings.
The strategy can be implemented via a separately managed account structured to meet the scheme's requirements or via a range of maturity-profiled pooled funds (1–5 years; 6–10 years; 11–15 years).

DB+

DB+ is an optional service layer, designed to further increase the efficiency of your LDI implementation and management. From initial implementation, through managing the portfolio all the way to handling the scheme's cashflows, the DB+ service dramatically reduces administrative burden.

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* This figure is presented as of December 31, 2020 and includes approximately $75.17 billion of assets with respect to SPDR products for which State Street Global Advisors Funds Distributors, LLC (SSGA FD) acts solely as the marketing agent. SSGA FD and State Street Global Advisors are affiliated.

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