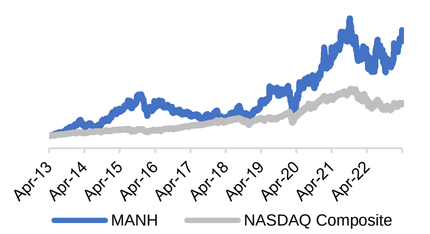
MANH: Price Target: $340, 5-year IRR (Dec 2027): 15%. Author: Aneish Goel

MANHATTAN ASSOCIATES (NASDAQ: MANH)

Summary:

MANH displays all the characteristics of a typical Russo investment – (1) an indispensable product (*mission critical, sticky supply chain software that is very hard to replace, reflected by its near-perfect retention and 5+-year customer contracts*), (2) a capacity to suffer (*willingness to spend ~$700M in R&D over 8-10 years to facilitate cloud transition and 'cannibalize' own license revenues; management's willingness to take pay cuts to protect employees during GFC & Covid*), (3) a capacity to reinvest (*significant R&D investments, ~30% shares returned to shareholders since 2009*), (4) vast TAM (*$20B+ spent on supply chain software & growing at mid-double digits annually, ~$5B addressable through MANH's ~1,200 captive customers transitioning to cloud alone*) (5) and a top management that has been together for 10-15 years.

Share price (MANH vs NASDAQ)



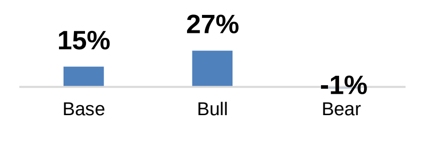
Key stats

Last price	$	165.7
Float		99%
Market cap ($M)	$	10,354
Shares out.		62.8
Enterprise Value ($M)	$	10,186
Net Cash	$	168
52 week High/Low		$175/$106.02
Volume (mm)		0.46

Valuation

FY23 Revenue	$	860
FY 23 EBIT	$	228
FY 23 FCF	$	226
EV/Revenue		11.8x
EV/EBIT		45.4x
FCF yield		2.2%

5-year IRR by case



Quality business characteristics

1	75%+ win-rates
2	95-100% retention
3	> 40% ROICs
4	20-30% FCF margins
5	30-35% cross-sales
6	1,200 customers
7	30% buybacks since '09
8	~$1.2B contracted RPO
9	10x LTV / CAC

With ~90% of its 1,200 captive customer base yet to transition to cloud, Covid triggering the increased '*Amazonisation*' supply chains in existing and new commerce verticals, deep vertical moats, and high switching costs, MANH has a long, secular runway of growth ahead of it. In the next 6 years, MANH could grow revenues by 14% (from ~$860M in 2023 to $1.6B in 2018), achieve 35% FCF margins (vs ~26% in 2023), and provide a **15% IRR**. Given cloud revenue visibility through long-term contracts, the risk of permanent loss of capital is limited, and there could be material upside (**25%+ IRR**) if cloud transition happens faster than expected and its new PoS product receives traction. While the market acknowledges MANH's market leadership and superior business model, it is still overly short-term focused and provides a patient investor the opportunity to make mid-teen IRRs.

Detailed company overview and business model:

MANH is a leading provider of mission-critical supply chain software and solutions for large enterprises (*>$250M+ revenue)* engaged in retail and (*now*) B2B commerce. It is a leading provider of Warehouse Management Software (WMS), Transportation Management Software (TMS), and Omni-Channel solutions (Omni) for 1,200+ enterprises globally such as Boeing, General Motors, Schneider Electric, Target, Starbucks, Nike, DHL, Home Depot, and others. MANH is deployed across 20k+ stores and thousands of distribution centres in 70+ countries.

MANH has a win rate of 75%+ against competitors (*with 90% of deals lost due to its premium pricing*), and its mission-critical nature as a '*central nervous system*' for commerce operations is reflected in its near-perfect retention rate (95%-100%), high operating and FCF margins (20-30%+), and incredible returns on invested capital (generally >40%). This is despite the fact that it is making significant investments in R&D currently to transition to cloud (~$700M in the last 9 years, currently at a run rate of $100M+/year). Customers typically upgrade their supply chain solutions only once every 8-10 years, which generates significant lock-in for MANH once they onboard a customer.

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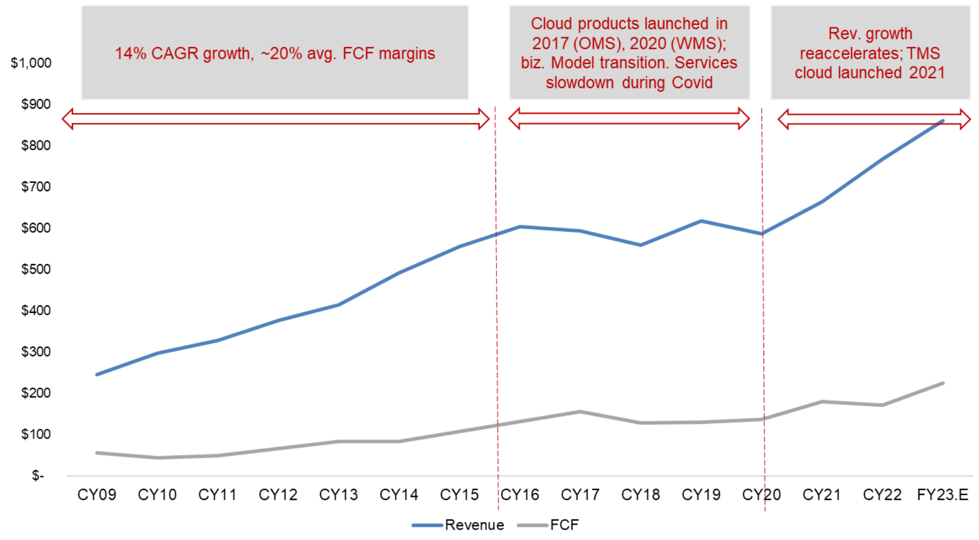
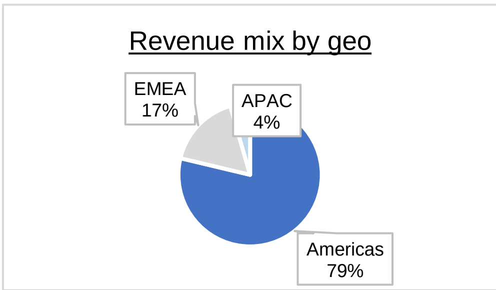


MANH has been undergoing a business model transition from license to cloud starting 2017, when it started selling a cloud version of its OMS product. The transition accelerated in 2020 with the cloud version of its WMS (*its key product in the license era with 50%+ revenues*) and Covid both providing tailwinds. In its new cloud model, MANH enters into 5+ year, non-cancellable contracts for its software products that are typically priced at $1-1.5M per year. This provides MANH with long-term revenue visibility. Its remaining performance obligations (*RPO, which MANH calls 'banked revenue')* on cloud revenue are currently ~$1.2B over 5+ years and management expects RPO to be ~$1.7-1.8B by 2024. This is despite their cloud products being recent (Omni in 2017 and WMS in 2020). MANH also generates significant up-sell and cross-sell revenue (*30%-35% of new bookings*) due to its complementary product suite and vendor consolidation by customers.

Unlike most enterprise software companies, MANH provides implementation, customization, and other services (*51% of revenue in 2022*) mainly through its own professionals instead of third-party IT services companies. Deploying its own professionals not only positions MANH as a thought leader in the industry but also enables on-ground recognition of industry developments and product feedback, creating a significant moat versus other competitors. Services/implementation revenue growth has also accelerated since slowing down during Covid in 2020, aided by spends made by customers to upgrade their technology and supply chain stacks.

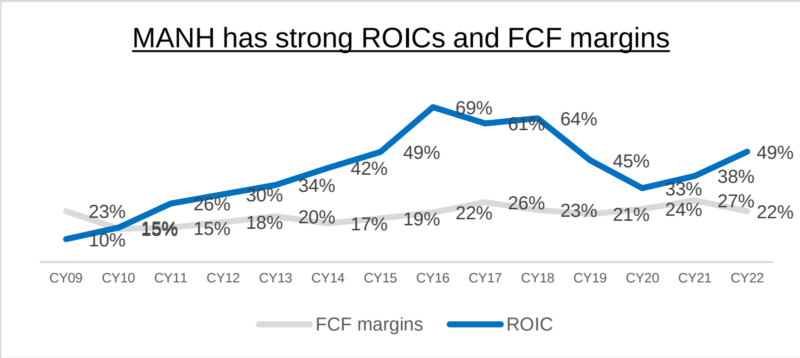
MANH currently generates 51% revenue from services, 23% from its cloud subscriptions, 19% from maintenance of its legacy license products, and 7% from license and hardware sales. The top 5 customers constitute ~11% of revenue. By geo, 79% of MANH's revenue comes from the Americas, 19% in EMEA, and 4% in APAC. In its new cloud business, its bookings mix is ~50% WMS, ~30% Omni, and ~20% TMS and others. MANH has ~$180M cash on its balance sheet with no debt and employs ~4,200 people, out of which ~1,800 are in its professional services team. MANH also has an R&D centre in India that employs ~2,000 people.



<u>Barriers to entry and MANH's moats</u> :

1. **High switching costs/inertia for customers given mission-criticality of MANH's products. Enables consistent ROIC > WACC; high operating and FCF margins**

It takes several years and millions of dollars (*~$700M for MANH over 8-10 years*) to build viable products. Sales cycles are 9-12 months long (*even multi-year*), and implementation and training can take a further 3+ years. Having made multi-year investments in installing such software, customers do not want to replace it unless they have no choice. Further, supply chain software is '*mission critical'* by nature and hard to rip out once installed. Equally, it is hard to get customer leads in the first place as customers only upgrade software once every 8-10 years and replace existing vendors only if unavoidable.



These industry and business model characteristics - massive R&D costs, multi-year sales and implementation cycles, low probability of switching vendors, and mission criticality - along with MANH's own superior offering and brand, make it incredibly hard to compete against. MANH already has 1,200+ logos it has worked with over ~30 years, a leading brand name, and near-perfect retention. *These characteristics are reflected in 40%+ ROICs and 20-30% FCF margins.*

2. Deep industry expertise and vertical focus, aided by R&D spending and professional services

WMS Gartner Magic Quadrant

MANH's software is extremely targeted towards *commerce-centric* enterprises generating $250M+ (more typically $1B+) in revenue. MANH has invested ~$700M+ in R&D over the last 8-10 years to develop integrated cloud-first products in this space while its competitors have relied on disjoined acquisitions to stitch together their offerings. MANH's on-ground implementations team generates continuous feedback loops for its products and keeps its pulse close to the industry.

As a result, MANH is considered an industry thought leader. This is reflected in MANH's leadership position in all relevant Gartner & Forrester Magic Quadrants (*see WMS quadrant on the left*), its 75%+ win rates, super-high retention, and premium pricing. Management believes that the quality gap of its products is only widening, and it offers by far the most superior solutions in its market today.

3. Mature cloud portfolio and vendor consolidation driving natural cross-sell

MANH's cloud portfolio – WMS, TMS, and Omni – now works in a fully integrated manner - something that no competitors can offer. Customers are increasingly preferring integrated *'bundle solutions'* from fewer vendors instead of many expensive *'point'* solutions from several vendors, and are increasingly discussing roadmaps for broader suite adoption with MANH.

This gives MANH a natural cross-sell advantage. For example, MANH can easily sell its TMS product to WMS customers, and 50% of its TMS customers also use MANH's WMS. Cross-sales are already 30-35% of new business today, and non-WMS products constitute ~50% of bookings. Cross-sales could continue to drive gains in non-WMS categories.

<u>The opportunity</u>:

1. Nascent cloud migration provides long runway for growth in captive customer base

The supply chain software industry is yet to meaningfully move to the cloud due to long update cycles (*once every 8-10 years*). MANH estimates that **<10% of its own customer base** has migrated to its cloud solutions. Barring some stragglers, it sees most customers wanting to migrate to cloud in the next 5-7 years.

This transition could eventually generate >$1B cloud revenue on its core WMS product alone ($1-1.5M/customer/year * 1,200 customers). With a suite of complementary cloud products providing proven cross-sell potential, ~90% of existing logos yet to transition to cloud, and new logo wins *(detailed in point 2*), MANH has a long runway of growth. Management has guided towards ~35%+ CAGR cloud growth till FY24. I believe that MANH can grow its cloud business by 30% over the next 5-6 years to $~900M. Even at this revenue, *MANH will have only penetrated ~50% of existing its customer base*.

2. **Covid has trigged the 'Amazonisation' of supply chains beyond classical D2C industries**

Covid not only accelerated digitization and migration to the cloud but also fundamentally rearchitected supply chains. The '*Amazonisation*' of B2B commerce led to industrial manufacturing, wholesale, life sciences, and other 'B2B' industries embracing D2C commerce, while consistent labour shortages and dynamic supply bottlenecks necessitated increased productivity through technology. As a result, retailers need continuous access to the latest innovation in supply chain software. This has accelerated the adoption of cloud products.

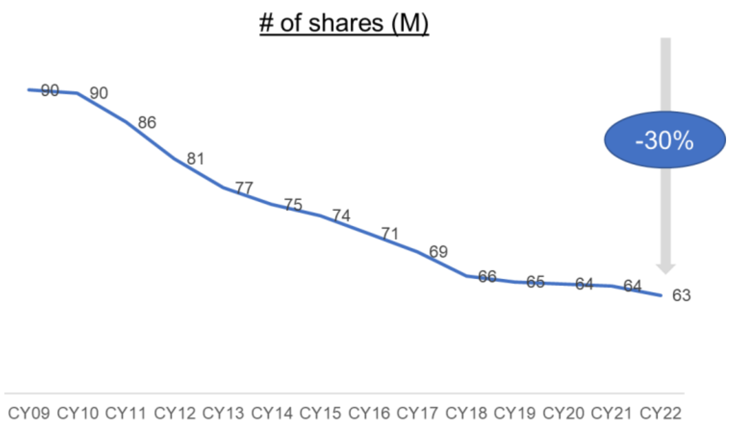
As a result, MANH's WMS cloud product, which was launched in 2020, already has 100+ customers. ~50% of these are new logos (*especially in B2B*) that MANH has never worked with before. 90%+ of MANH's software is deployed for retrofitting and automating existing warehouses, not for developing new ones. Further, as previously highlighted, MANH is also benefitting from software vendor consolidation by customers, resulting in 30-35% cross-sales already.

3. **MANH's industry expertise, mission-criticality, and long sales cycles make it a sticky, FCF machine with incredible unit economics**

As highlighted extensively in the section on business moats, MANH is an industry thought leader in retail and supply chain. Its portfolio of supply chain products is far superior to other offerings in the market, which is reflected in its 75%+ win-rates. Its mission-critical nature is reflected in near-perfect retention, and it has a large captive customer base already.

These moats translate into an extremely high LTV/CAC (10x+) and incredible FCF margin & high ROIC business, and will only strengthen with scale and operating leverage as more customers move to the cloud.

4. **Management are great stewards of capital**



MANH's management is one of the most humble and well-regarded in the industry. They are known for their great stewardship of capital, ability to predict and navigate industry trends, and their leadership. MANH has bought back ~30% of its shares since 2009, kept the balance sheet debt-free, and generated significant cash. Across CEOs, MANH management took salary cuts during GFC & Covid to absorb losses and ensure retention. They are also known for their consistently reliable commentary in their notes. The top leaders including the CEO Eddie Capel and CFO Dennis Story have all been in their roles for 10+ years, demonstrating MANH's stability and success with a complex business model transition despite several challenges over the last decade.

Addressable Market Opportunity:

Gartner pegs the supply chain software market to be **~$20B+ and growing at mid-double digits.** ~50% of the market is in the US. Of that, WMS and TMS are each estimated to be ~$3-4B each by various sell side reports and online publications, while the total TAM including Omni-channel is estimated to be **$10B+**.

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The management believes that MANH still only has *~20%* share in the WMS market and *~2%* in supply chain software. However, more importantly, MANH has a '*captive*' customer base that could alone generate ~$4-5B in cloud revenue. <10% of its 1,200+ customers have migrated to the cloud. **With a deal value of ~$1-1.5M/year, 1,200 customers, and 3 products, its TAM from existing customer migration could be ~$3.6 – 5.4B.**

Captive cloud TAM ($M)	
# of customers	1200
ARPU/customer	1.25
# of products	3
Captive cloud' TAM	**$ 4,500**

Competition:

Competition comes from Blue Yonder (JDA), Korber (HighJump), IBM, ERPs (Oracle/SAP/Infor), and a long tail of others, and varies by product. However, MANH products are top-rated in all categories by Gartner and Forrester. As previously mentioned, MANH's product portfolio works in an integrated manner and is far superior to competitors' stitched up offerings that have relied heavily on acquisitions. MANH's 75%+ win-rates reflect their dominance against competitors.

Please see the Appendix for relevant Gartner/Forrester quadrants showcasing the competitive landscape by category.

Upside from Point-of-Sale:

In addition to its 3 core products, MANH is also developing an advanced point-of-sale (PoS) software product for large retailers. PoS solutions have historically been hardware-centric, and MANH believes there is a large opportunity in this space (*TAM as large as its other core products*) and the product has natural synergies with its Omni-channel suite. MANH is waiting for 10-12 referenceable customers, which it expects to get by the end of FY23, before marketing the PoS solution more aggressively. But it has won some key accounts recently and 2-3% of its existing 20k stores already use PoS software from MANH. A successful PoS product could add further upside to existing estimates.

Risks and mitigants:

1. **Competition**: MANH faces competition from both large ERP companies (SAP, Oracle, Infor) and niche point solutions, both of which could attack specific segments of MANH's TAM.
   Mitigant: MANH has a much superior offering and competitors will need hundreds of millions in R&D to develop equivalent products. Customers also prefer integrated solutions, and hence point solutions may not see traction.
2. **Partner network**: While MANH's professional services team serves as a moat, many organizations value the flexibility offered by third-party IT partners for support & implementation.
   Mitigant: MANH has made it a strategic priority to expand its third-party network due to excess demand for its services. This should alleviate concerns from customers who value third-party access.
3. **Potential management change**: Most of MANH's existing management, including the CEO Eddie Capel and CFO Dennis Story, have been at the helm for 10+ years and may transition in the future.
   Mitigant: MANH has a history of training and promoting internal candidates. The current CEO was also a COO and an EVP at MANH before. It would be ideal for new management to take over once the cloud transition is on autopilot.
4. **Elongated sales cycles**: A macro slowdown could slow sales cycles and lead to lower near-term growth.
   Mitigant: The long-term structural tailwinds for cloud migration remain in place, and a slowdown should not impact the long-term conversion opportunity. Further, only ~10% of MANH's warehouse deployments are greenfield.

Valuation commentary:

Summary: I have valued MANH both using AV/EPV based ROIC approaches and through target FCF yields on forecasts. I have assumed a target 3% Free Cash Flow yield on FY28 revenues for a **~5-year price target of ~$340 on MANH, which results in a ~15% base case IRR**. The assumed FCF yield is similar to other high-quality businesses with similar characteristics. With a long holding duration and given the inherent visibility of revenues in the business, I see limited risk of permanent impairment of capital, and my bear case is also nearly breakeven. My bull case could result in a 25%+ IRR driven by higher operating leverage, faster cloud growth, and PoS upside.

Asset Value: MANH's critical assets are their customer relationships and its product portfolio.

Customer relationships: It takes an est. ~$0.9M to acquire a customer today. With 1,200 customers, that leads to a customer value of $1B+. More aggressively, since MANH acquired these customers over 20+ years and saw 95-100% retention, the true '*acquisition value'* of customers could be closer to $2.3B today (*assuming 5% annual churn over ~20 years*).

Product portfolio: MANH has spent ~$700M since 2013 on revamping its product portfolio, which would be valued at ~$318M conservatively after depreciation.

Total AV: Combined with other minor adjustments, we get an asset value of ~$1.5 - $2.8B. This is much higher than the balance sheet equity value of $227M in 2022. As expected, MANH derives significant value from intangibles. There are no off-balance sheet liabilities, but it may be prudent to assume a buffer for potential cybersecurity risks.

Earnings Power Value: I believe that current earnings do not provide a 'sustainable' view of earnings power value as the company is in the very early stages of transitioning towards cloud.

Conservative approach: Using Q1 '23 annualized revenues ($884M) at 25% GAAP operating margins (*much lower than historical highs*) and adjusting for growth capex spends in product, customer acquisition, and transitioning existing customers to the cloud, we get a $2.8B EPV at a ~10% WACC *(~ to FactSet, cross-checked through equity risk premium data from Aswath Damodaran)*. Note that MANH's WACC is basically its cost of equity as there is not debt.

Aggressive approach: Assuming a stable state when 80% of its 1,200 customers transition to cloud, pay $1.25M/year in cloud fees and $0.33M/year in services, and have a ~15% attach rate for 2 products (*similar to what is seen today despite early stages of cross-sell*), we get a revenue potential of ~$1.8B. With a 25% operating margin, adjustments for growth capex in product and customer acquisition, and a ~10% WACC, we get an EPV of ~$4B. Note that there is no adjustment for 'maintenance capex on customers – i.e. customers transitioning to cloud', in this approach.

ROIC-based valuation: As EPV > AV, there are competitive advantages. Even with conservative assumptions such as a 22% marginal ROIC (*artificially suppressed due to Covid & business model transition*), 11% organic growth (*implied revenue growth if 80% of its 1,200 customers transition to cloud; lower than Gartner industry growth estimates of ~14%*), a 2.5% income yield, and a ~23% multiple compression (*for a target FCF yield of 3% - similar to other high-quality enterprise software businesses*), **we get a 5-year IRR of 15%**. My **bull case**, with 15% organic growth (*aided by PoS & higher than Gartner estimates*) and no multiple compression results in a **27% IRR**, while my **bear case**, with ~6% organic growth and a 50%+ multiple compression (*FCF yield of 5%*), still results in no material impairment of capital (**~-1% IRR**) over 5 years.

Model-based valuation: I have conservatively modelled a 14% revenue CAGR (30% cloud) till FY28, ~36% non-GAAP EBIT margins, and ~35% FCF margins. This is in-line with management guidance of '*low double-digit revenue growth and top-quartile operating margins benchmarked to other enterprise software companies'*. With some buybacks and a 3% FCF yield, we get **a ~15% base case IRR**. A DCF approach suggests a ~10% discount to future cash flows at current prices.

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Appendix:

Model summary – base case

	Dec-13 FY2013	Dec-14 FY2014	Dec-15 FY2015	Dec-16 FY2016	Dec-17 FY2017	Dec-18 FY2018	Dec-19 FY2019	Dec-20 FY2020	Dec-21 FY2021	Dec-22 FY2022	Dec-23 FY2023	Dec-24 FY2024	Dec-25 FY2025	Dec-26 FY2026	Dec-27 FY2027	Dec-28 FY2028
Revenue	**$ 415**	**$ 492**	**$ 556**	**$ 605**	**$ 595**	**$ 559**	**$ 618**	**$ 586**	**$ 664**	**$ 767**	**$ 860**	**$ 987**	**$ 1,118**	**$ 1,264**	**$ 1,436**	**$ 1,648**
% growth	*10%*	*19%*	*13%*	*9%*	*-2%*	*-6%*	*11%*	*-5%*	*13%*	*16%*	*12%*	*15%*	*13%*	*13%*	*14%*	*15%*
Cloud + services	$ 316	$ 376	$ 428	$ 358	$ 336	$ 353	$ 407	$ 383	$ 457	$ 571	$ 701	$ 849	$ 1,013	$ 1,190	$ 1,385	$ 1,608
% growth	*11%*	*19%*	*14%*	*-16%*	*-6%*	*5%*	*15%*	*-6%*	*19%*	*25%*	*23%*	*21%*	*19%*	*17%*	*16%*	*16%*
as % of revenue	76%	76%	77%	59%	57%	63%	66%	65%	69%	74%	82%	86%	91%	94%	96%	98%
Gross Margin	$ 233	$ 280	$ 321	$ 355	$ 349	$ 318	$ 333	$ 316	$ 366	$ 409	$ 451	$ 531	$ 605	$ 692	$ 802	$ 944
as % of revenue	56%	57%	58%	59%	59%	57%	54%	54%	55%	53%	52%	54%	54%	55%	56%	57%
S&M	$ 45	$ 53	$ 49	$ 48	$ 47	$ 51	$ 57	$ 48	$ 58	$ 65	$ 71	$ 90	$ 105	$ 118	$ 134	$ 153
as % of revenue	11%	11%	9%	8%	8%	9%	9%	8%	9%	8%	8%	9%	9%	9%	9%	9%
G&A	$ 37	$ 44	$ 49	$ 48	$ 46	$ 53	$ 65	$ 61	$ 68	$ 73	$ 91	$ 99	$ 107	$ 114	$ 123	$ 133
as % of revenue	9%	9%	9%	8%	8%	9%	10%	10%	10%	10%	11%	10%	10%	9%	9%	8%
R&D	$ 45	$ 49	$ 54	$ 55	$ 58	$ 72	$ 88	$ 84	$ 98	$ 112	$ 127	$ 141	$ 154	$ 167	$ 183	$ 202
as % of revenue	11%	10%	10%	9%	10%	13%	14%	14%	15%	15%	15%	14%	14%	13%	13%	12%
D&A	$ 6	$ 6	$ 8	$ 9	$ 9	$ 9	$ 8	$ 9	$ 8	$ 7	$ 7	$ 8	$ 9	$ 10	$ 11	$ 13
as % of revenue	1%	1%	1%	2%	2%	2%	1%	2%	1%	1%	1%	1%	1%	1%	1%	1%
EBIT, GAAP	$ 101	$ 127	$ 161	$ 194	$ 186	$ 134	$ 116	$ 114	$ 134	$ 153	$ 156	$ 193	$ 231	$ 283	$ 351	$ 444
as % of revenue	24%	26%	29%	32%	31%	24%	19%	19%	20%	20%	18%	20%	21%	22%	24%	27%
EBIT, non-GAAP	$ 109	$ 137	$ 176	$ 211	$ 202	$ 154	$ 148	$ 148	$ 178	$ 212	$ 228	$ 278	$ 329	$ 395	$ 480	$ 592
as % of revenue	26%	28%	32%	35%	34%	28%	24%	25%	27%	28%	26%	28%	29%	31%	33%	36%
EBITDA, GAAP	$ 107	$ 134	$ 169	$ 203	$ 195	$ 143	$ 124	$ 123	$ 142	$ 159	$ 163	$ 201	$ 240	$ 293	$ 363	$ 457
as % of revenue	26%	27%	30%	34%	33%	25%	20%	21%	21%	21%	19%	20%	21%	23%	25%	28%
EBITDA, non-GAAP	**$ 114**	**$ 143**	**$ 184**	**$ 220**	**$ 211**	**$ 163**	**$ 156**	**$ 157**	**$ 186**	**$ 219**	**$ 235**	**$ 286**	**$ 338**	**$ 405**	**$ 492**	**$ 605**
as % of revenue	28%	29%	33%	36%	36%	29%	25%	27%	28%	29%	27%	29%	30%	32%	34%	37%
PBT	$ 103	$ 128	$ 163	$ 196	$ 185	$ 136	$ 116	$ 114	$ 134	$ 158	$ 156	$ 194	$ 231	$ 283	$ 351	$ 444
as % of revenue	25%	26%	29%	32%	31%	24%	19%	19%	20%	21%	18%	20%	21%	22%	24%	27%
Net income	**$ 67**	**$ 82**	**$ 103**	**$ 124**	**$ 116**	**$ 105**	**$ 86**	**$ 87**	**$ 110**	**$ 129**	**$ 124**	**$ 159**	**$ 190**	**$ 232**	**$ 289**	**$ 365**
as % of revenue	16%	17%	19%	21%	20%	19%	14%	15%	17%	17%	14%	16%	17%	18%	20%	22%
# of shares, EoP	77	75	74	71	69	66	65	64	64	63	62	62	61	60	59	58
EPS, FD, GAAP	**$ 0.9**	**$ 1.1**	**$ 1.4**	**$ 1.7**	**$ 1.7**	**$ 1.6**	**$ 1.3**	**$ 1.4**	**$ 1.7**	**$ 2.0**	**$ 2.0**	**$ 2.6**	**$ 3.1**	**$ 3.8**	**$ 4.8**	**$ 6.2**
EPS, FD, non-GAAP	**$ 0.9**	**$ 1.2**	**$ 1.5**	**$ 1.9**	**$ 1.9**	**$ 1.8**	**$ 1.7**	**$ 1.8**	**$ 2.2**	**$ 2.8**	**$ 2.9**	**$ 3.7**	**$ 4.4**	**$ 5.4**	**$ 6.6**	**$ 8.3**
Unl. Free Cash Flow	**$ 84**	**$ 84**	**$ 108**	**$ 133**	**$ 157**	**$ 129**	**$ 131**	**$ 138**	**$ 181**	**$ 173**	**$ 226**	**$ 281**	**$ 325**	**$ 387**	**$ 468**	**$ 575**
as % of revenue	20%	17%	19%	22%	26%	23%	21%	24%	27%	22%	26%	28%	29%	31%	33%	35%
uFCF/Share	**$ 1.1**	**$ 1.1**	**$ 1.5**	**$ 1.9**	**$ 2.3**	**$ 2.0**	**$ 2.0**	**$ 2.1**	**$ 2.8**	**$ 2.7**	**$ 3.6**	**$ 4.5**	**$ 5.3**	**$ 6.4**	**$ 7.9**	**$ 9.9**
RPO	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 77**	**$ 172**	**$ 309**	**$ 699**	**$ 1,052**	**$ 1,400**	**$ 1,801**	**$ 2,215**	**$ 2,614**	**$ 3,006**	**$ 3,396**
as % of revenue	0%	0%	0%	0%	0%	14%	28%	53%	105%	137%	163%	182%	198%	207%	209%	206%
Bookings	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 100**	**$ 142**	**$ 217**	**$ 513**	**$ 529**	**$ 590**	**$ 746**	**$ 873**	**$ 986**	**$ 1,126**	**$ 1,294**
as % of revenue	0%	0%	0%	0%	0%	18%	23%	37%	77%	69%	69%	76%	78%	78%	78%	79%
% growth							41%	53%	136%	3%	12%	26%	17%	13%	14%	15%
Net cash	$ 124	$ 116	$ 118	$ 96	$ 126	$ 99	$ 78	$ 177	$ 241	$ 211	$ 218	$ 331	$ 401	$ 521	$ 708	$ 985
ROIC, GAAP	**34%**	**42%**	**49%**	**69%**	**61%**	**64%**	**45%**	**33%**	**38%**	**49%**	**54%**	**52%**	**56%**	**56%**	**52%**	**47%**
ROIC, non-GAAP	**39%**	**47%**	**56%**	**78%**	**70%**	**77%**	**61%**	**45%**	**53%**	**70%**	**81%**	**77%**	**82%**	**80%**	**73%**	**65%**

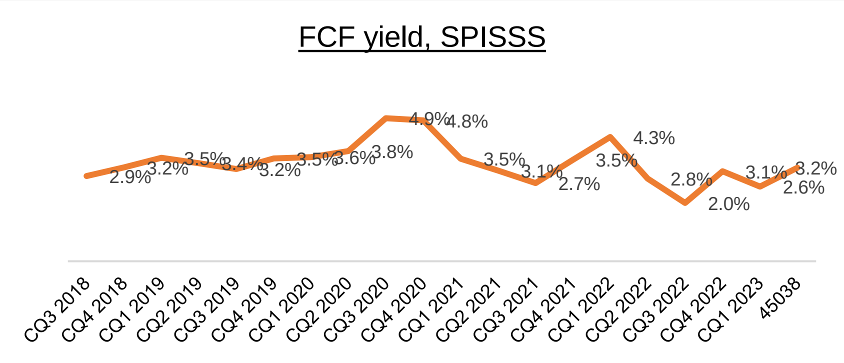
Valuation - using 3% target FCF yield

Stock Price	**$ 165.7**	**FY2023**	**FY2024**	**FY2025**	**FY2026**	**FY2027**	**FY2028**
Shares Oustanding	63	62	62	61	60	59	
Revenue		$ 860	$ 987	$ 1,118	$ 1,264	$ 1,436	$ 1,648
Adj. EBITDA		$ 235	$ 286	$ 338	$ 405	$ 492	$ 605
uFCF		$ 226	$ 281	$ 325	$ 387	$ 468	$ 575
Market Cap	$ 10,442	$ 10,337	$ 10,255	$ 10,101	$ 9,949	$ 9,800	
Net Cash / (Debt)	$ 211	$ 218	$ 331	$ 401	$ 521	$ 708	
EV	$ 10,231	$ 10,119	$ 9,924	$ 9,700	$ 9,428	$ 9,092	
EV/Tot. Sales		10.2x	8.9x	7.7x	6.6x	5.5x	
EV/EBITDA		35.4x	29.4x	23.9x	19.2x	15.0x	
uFCF		2.8%	3.3%	4.0%	5.0%	6.3%	
Tgt FCF Yield		**3.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**	
EV		$ 9,375	$ 10,835	$ 12,908	$ 15,603	$ 19,172	
Market Cap		$ 9,593	$ 11,166	$ 13,308	$ 16,124	$ 19,880	
Stock Price		**$ 154**	**$ 180**	**$ 218**	**$ 269**	**$ 336**	
Discount Period		1	2	3	4	5	
IRR		**-7.2%**	**4.3%**	**9.6%**	**12.8%**	**15.2%**	
Implied EV/Sales		9.5x	9.7x	10.2x	10.9x	11.6x	
Implied EV/EBITDA		32.8x	32.1x	31.8x	31.7x	31.7x	
Implied EV/FCF		33.3x	33.3x	33.3x	33.3x	33.3x	

High business quality and long-duration compounding results in mid-teens 5-year IRR despite conservative FCF yield valuations

MANH: Price Target: $340, 5-year IRR (Dec 2027): 15%. Author: Aneish Goel

Similar high-quality businesses trade at ~3% FCF yields



FCF yields for the S&P Software & Services Select Industry Index have been ~2.5-4% over the last 5 years, excluding during Covid.

$2-100B market cap enterprise software companies in this index, having revenue growth + FCF margins > 30%, currently trade at ~34x TEV / LTM uFCF (~30x NTM).

Non-software companies with similar business quality also trade at 30-40x uFCF.

Asset Value

Conservative

Asset Value: conservative

2022		
# of new logos acquired		75
S&M spend	$	65
Cost of acquiring a logo	$	0.9
# of customers		1,200
Customer value	**$**	**1,038**

	6	5	4	3	2	1	0
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
R&D spend	$ 55	$ 58	$ 72	$ 88	$ 84	$ 98	$ 112
Weight	0.3	0.3	0.4	0.5	0.6	0.8	1
Product portfolio	**$ 45**	**$ 59**	**$ 82**	**$ 119**	**$ 161**	**$ 225**	**$ 318**
Maintenance	$ 9	$ 12	$ 16	$ 24	$ 32	$ 45	$ 64
Growth	$ 46	$ 46	$ 55	$ 64	$ 52	$ 53	$ 48
Tax rate	37%	37%	23%	26%	23%	18%	18%
After tax growth	$ 29	$ 29	$ 43	$ 47	$ 40	$ 43	$ 39

Product portfolio	**$**	**318**

	# of employees	Avg. salary
Total	4,200	$ 89
India	1,800	$ 20
US	2,400	$ 140

Workforce reproduction	**$**	**18**
Goodwill	**$**	**(63)**
Total Equity, 2022, BS	**$**	**227**
Asset Value	**$**	**1,538**

Aggressive

Asset Value: aggressive

# of new logos acquired		75	
S&M spend	$	65	
Cost of acquiring a logo	$	0.9	
# of customers		2,641	Including customers churned over 20 years (assuming 5% annual churn)
Customer value	**$**	**2,284**	

		6	5	4	3	2	1	0
		2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
	R&D spend	$ 55	$ 58	$ 72	$ 88	$ 84	$ 98	$ 112
20%	Weight	0.3	0.3	0.4	0.5	0.6	0.8	1
	Product portfolio	**$ 45**	**$ 59**	**$ 82**	**$ 119**	**$ 161**	**$ 225**	**$ 318**
	Maintenance	$ 9	$ 12	$ 16	$ 24	$ 32	$ 45	$ 64
	Growth	$ 46	$ 46	$ 55	$ 64	$ 52	$ 53	$ 48
	Tax rate	37%	37%	23%	26%	23%	18%	18%
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Product portfolio	**$**	**318**

	# of employees	Avg. salary
Total	4,200	$ 89
India	1,800	$ 20
US	2,400	$ 140

Workforce reproduction	**$**	**18**	
Goodwill	**$**	**(63)**	
Total Equity, 2022, BS	**$**	**227**	https://www.crunchbase.com/search/acquisitions/field/organizations/num_acquisitions/jda-software
Asset Value	**$**	**2,784**	JDA spent 2.8B spent atleast on 3 acquisitions and still created subpar product

MANH: Price Target: $340, 5-year IRR (Dec 2027): 15%. Author: Aneish Goel

Earnings Power Value (conservative & aggressive)

Earnings Power Value: conservative

	Revenue	$	884	Q1'23 annualized
	Op margin		25%	
	Operating income	**$**	**221**	
1	Customer value	$	13	
2	Product portfolio	$	48	
3	Other	$	52	Maintenance marketing ~= migrating existing customers to cloud
	Adj. Operating income	**$**	**334**	
	% margin		*38%*	
	Tax rate		22%	
	Adj. NOPAT	**$**	**260**	
	WACC		10%	
	EV Op Business	**$**	**2,577**	
	Cash	$	182	
	Debt	$	13	
	EPV Equity	**$**	**2,745**	
1	S&M spend	$	65	
	Churn		5%	
	# of customers		1,200	
	Acquisition/customer	$	0.9	
	Maintenance	$	52	
	Growth	$	13	
2	R&D expense	$	112	
	Depreciation		20%	
	Maintenance	$	64	
	Growth	$	48	
	ERP		5.9%	
	Rf		3.6%	
	Beta		1.1	
	COE/WACC		10.1%	

Earnings Power Value: aggressive

	Revenue	$	1,760
	Op margin		25%
	Operating income	**$**	**440**
1	Customer value	$	13
2	Product portfolio	$	48
3	Other	$	-
	Adj. Operating income	**$**	**501**
	% margin		*28%*
	Tax rate		22%
	Adj. NOPAT	**$**	**391**
	WACC		10%
	EV Op Business	**$**	**3,867**
	Cash	$	182
	Debt	$	13
	EPV Equity	**$**	**4,036**
1	S&M spend	$	65
	Churn		5%
	# of customers		1,200
	Acquisition/customer	$	0.9
	Maintenance	$	52
	Growth	$	13
2	R&D expense	$	112
	Depreciation		20%
	Maintenance	$	64
	Growth	$	48
	ERP		5.9%
	Rf		3.6%
	Beta		1.1
	COE/WACC		10.1%

ROIC-based returns

Returns

	2000	2001	2002	2018	2019	2020	2021	2022
Repurchase of stock	$ -	$ 1	$ 4	$ 149	$ 122	$ 44	$ 120	$ 205
TEV	$ 853	$ 802	$ 573	$ 3,020	$ 4,853	$ 5,976	$ 9,455	$ 8,239
Income yield	**0%**	**0%**	**1%**	**5%**	**3%**	**1%**	**1%**	**2%**
Income yield	**2.5%**							
Growth capex/Adj NOPAT								
Average	40%			43%	47%	37%	38%	37%
ROIC	22%							
Organic growth	11%	Revenue growth if 80% of customer base transitions to cloud						
g	**20%**							

	Base	Bull	Bear
Income yield	2.5%	3.5%	1.5%
Growth	19.9%	23.9%	14.9%
Multiple	-22.7%	0.0%	-53.6%

FCF, FwD	$	226
g		20%
Time, yrs		5
FCF, 5 yrs	$	561
EV today	$	9,734
Fwd EV/FCF today		43.1x
Compression		-23%
EV/FCF, 5 years		33.3x
EV, 5 years	$	18,673
Net Cash	$	211
Market Cap	**$**	**18,884**
# of shares today		63
Rate of growth		-2.5%
# of shares, 5 years		56
Price/Share today	$	166
Price/Share, 5 years	**$**	**340**
IRR		**15.4%**

MANH: Price Target: $340, 5-year IRR (Dec 2027): 15%. Author: Aneish Goel

DCF

Discounted value of free cash flows suggests a ~10% discount to intrinsic value today (model made till year 6).

Time		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Terminal 15
Free Cash Flows	$ 173	$ 226	$ 282	$ 325	$ 387	$ 468	$ 575	$ 696	$ 827	$967	$ 1,112	$1,255	$1,393	$1,518	$1,624	$1,015	$22,565
% growth		*31%*	*25%*	*16%*	*19%*	*21%*	*23%*	*21%*	*19%*	*17%*	*15%*	*13%*	*11%*	*9%*	*7%*	*5%*	
Present Value of Cash Flows		$ 215	$ 244	$ 248	$ 269	$ 297	$ 334	$ 369	$ 400	$427	$ 449	$ 463	$ 469	$ 467	$ 456	$ 260	$ 5,784

Enterprise Value	$ 11,150
Debt	$ 13
Cash	$ 182
Market Cap	**$ 11,318**
# of shares	$ 63
Price Per Share	**$ 180**
Current Share Price	**$ 166**
Dispersion	*9%*

10%	WACC	Assuming a Beta of 1
5%	Terminal growth	Natural pricing power for MANH, embedded cross-sell, large TAM
22.2x	FCF Terminal multiple	

Gartner/Forrester quadrant images:

TMS (Gartner) & OMS (Forrester) (left to right)