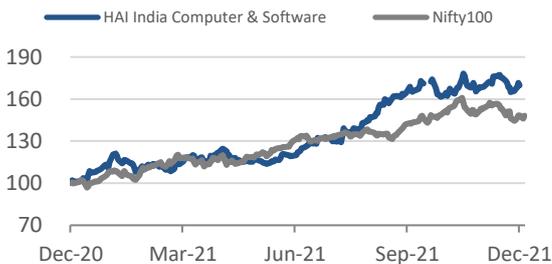


India Computer & Software

C. E. Info Systems Fixes IPO Price Band at Rs1,000-Rs1,033 Per Share

Investment Focus



Source: Factset, HTI

Related Reports

Key takeaways from Aptech's Q2FY22 earnings call (18 Nov 2021)

Another Quarter of Acceleration in Growth (7 Oct 2021)

IPO Details: Pursuant to the DRHP filed in August'21, and post approval from SEBI; C. E. Info Systems (unlisted) has fixed IPO price band at Rs1,000 to Rs1,033 per share. The issue size of the IPO stands at Rs10.4bn at the upper price band. The entire issue is an offer for sale by selling shareholders including promoter Rashmi Verma, investor shareholders including Qualcomm Asia Pacific Pte. Ltd. & Zenrin Co Ltd and other selling shareholders. At the upper price band of IPO, valuation stands at ~Rs55bn both on pre-money and post-money basis.

Strong play for the digital mapping opportunity: C. E. Info Systems (MapmyIndia) is a data and technology products and platforms provider of proprietary digital maps as a service ("MaaS"), software as a service ("SaaS") and platform as a service ("PaaS"). It has dominant position in the domestic market for which Frost & Sullivan expects the digital maps and location intelligence technology & services market to grow at CAGR of 15.5% over 2019-2025 to US\$7.74 bn in 2025. In comparison, MapmyIndia's current revenue run-rate is at Rs1.5 bn/Rs1 bn in FY21/H1FY22. Through its brand Mapples it targets to take its solutions to the international market.

Transformation into products/platform company: MapmyIndia's solutions are segmented amongst map & data products (44.9% of revenue in H1FY22) and platform & IoT products (55.1% of revenue). MapmyIndia has been able to drive faster growth in platform & IoT products at CAGR of 16.9% over FY19-FY22 (considering annualized revenue of H1FY22).

As regards verticals, from serving the Automotive vertical (39.2% of revenue) the company has been able to transform into mapping & digital solutions provider to the Corporate vertical (53.7% of revenue) in which it has been able to drive a strong growth at CAGR of 43.1% over FY19-FY22. Its order-book has grown to Rs4.68 bn in FY21 from Rs1.41 bn in FY19 (avg. order tenure of ~3years) which provides strong visibility for future growth.

Strong operating leverage: Given its product/platform based nature of business MapmyIndia enjoys strong operating leverage. This is been evident from the fact that its EBIT margin more than doubled from 12.1% in FY19 to 27.2% in FY21 and further to 41.4% in H1FY22 (11.4% in H1FY21). Driven by its strong margin and FCF profile, MapmyIndia had surplus cash of Rs3.8 bn as of end-H1FY22

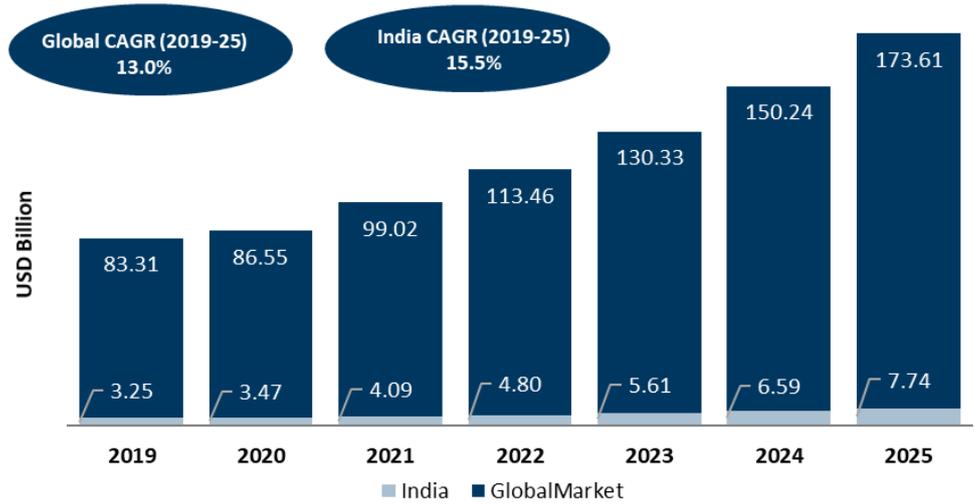
Risks:

For FY19/20/21/H1FY22, 80% of MapmyIndia's revenue were from 17/22/25/18 clients. Moderation in or loss of large client remains a key monitorable. Operational and regulatory risk in international markets also remains a key monitorable.

Takeaways from Pre-IPO analyst meet (06th December, 2021)

- MapmyIndia has been the tier-1 service provider to the automotive vertical for now over 14 years; It has ~80% market share in the vertical and in case of vehicles where there is in-built mappings solution it would be mostly MapmyIndia
- Clients using its APIs includes new-age companies like PhonePe, Flipkart, PayTM, Grofers
- In the Government business (<10% of revenue) MapmyIndia is place as product/platform company would along with systems integrators
- TAM for the company in India is significant given that 20m vehicles (230mn two-wheelers, 40 mn passenger vehicles and 9.5mn commercial vehicles) sold p.a. in India. This gets added to 280mn vehicles as of end-2020. Further, 37mn app downloads as expected in India for FY22
- Currently MapmyIndia has ~500 clients and has served 2,000+ clients since inception; In FY19 ~80% of revenue was from 18 clients and in FY21 25 clients contributed to ~80% of revenue; Company's clients include PhonePe, Flipkart, Yulu, HDFC Bank, Airtel, Hyundai, MG Motor, Avis, Safexpress and Goods and Service Tax Network ("GSTN").
- Orderbook has increased to Rs4.68 bn in FY21 from Rs1.4 bn in FY19 providing good visibility for growth with avg. tenure of the contract is ~3 years
- Billing is generally done on per vehicle/per year basis or on per API transaction basis
- Given that the company is a product and platform company, revenue growth provides significant operating leverage
- R&D - all the R&D cost is expense in the same year; almost all of the technical cost is R&D cost given that the company is a product/platform company
- M&A remains a key focus area for the company and it would focus on technology-led and/or revenue-led acquisitions
- Partnership with ISRO - to provide end-to-end indigenous geospatial solutions through a combination of satellite-based mapping solution and ground-based mapping solutions
- Damage risk - it gets covered in the legal documentation and company has processes in-place to negate the impact of the same
- Do not have a hedging policy given than the company is a net exporter; every year there is a review of the hedging policy
- 3D/4D mapping without a strong underlying core mapping data would work on piece meal
- Mapmyindia differentiates over peers for the accurate last-mile mapping solutions; Also it provides multiple APIs which help clients enhance the CX for customers of clients
 - Cowin – mapping was enabled in 2 days

Digital Maps and Location Intelligence Technology & Services – Total Addressable Market*



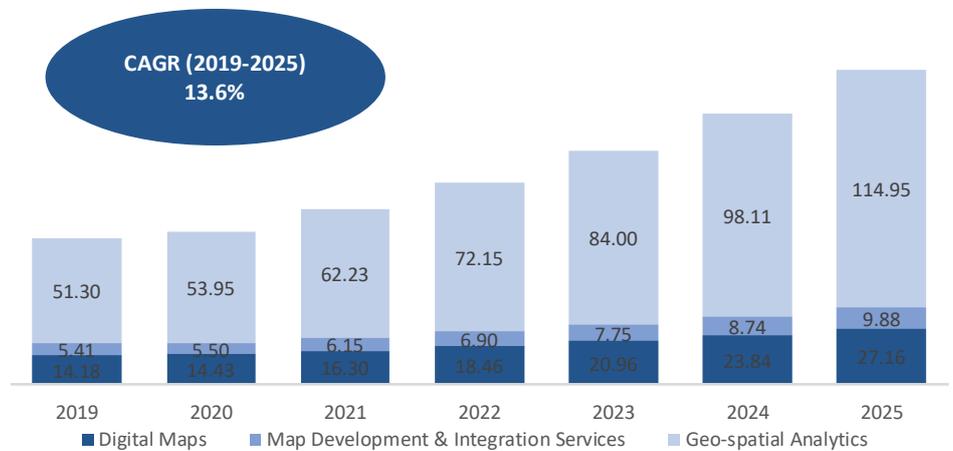
Source: Frost & Sullivan, RHP

Global Digital Map Services Market

	DIGITAL MAPS	MAP DEVELOPMENT & INTEGRATIONS SERVICES	GEO-SPATIAL ANALYTICS	TOTAL
Market Size, CY2020	14.4	5.5	53.9	73.8
Market Size, CY2021E	16.3	6.1	62.2	84.6
Market Size, CY2025E	27.1	9.8	114.9	151.9
CAGR (2019-2025E)	11.4%	10.6%	14.4%	13.6%
Growth Phase	Growth Phase	Growth Phase	Growth Phase	Growth Phase

Source: Frost & Sullivan, RHP; Note : Digital Map consists of Map Data and Traffic Data sub-segments

Global Digital Map Services Market (US\$ bn)



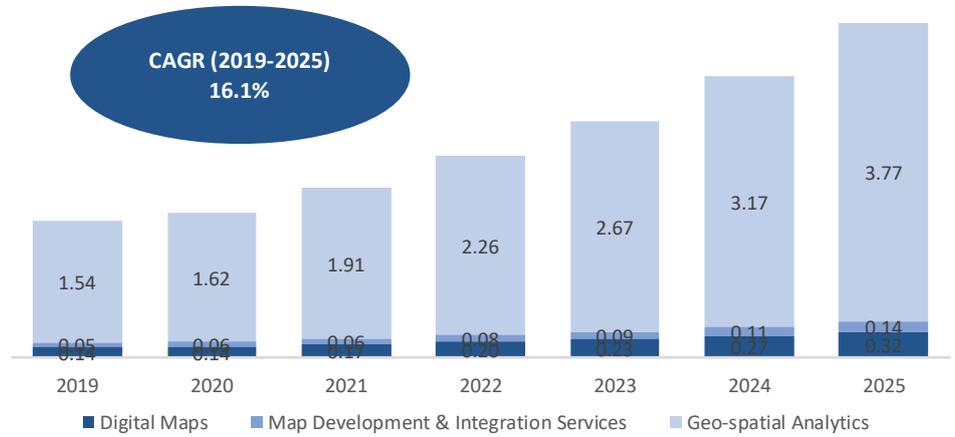
Source: Frost & Sullivan, RHP

Indian Digital Map Services Market

(US\$ bn)	DIGITAL MAPS	MAP DEVELOPMENT & INTEGRATIONS SERVICES	GEO-SPATIAL ANALYTICS	TOTAL
CY2020	0.14	0.05	1.6	1.8
CY2021E	0.16	0.06	1.9	2.1
CY2025E	0.32	0.13	3.7	4.2
CAGR (2019-2025E)	14.8%	16.9%	16.1%	16.0%
Growth Phase	Growth Phase	Growth Phase	Growth Phase	Growth Phase

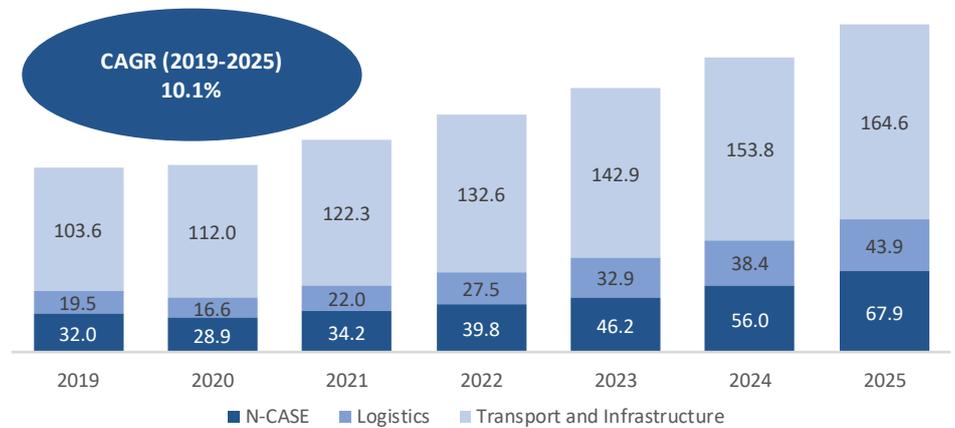
Source: Frost & Sullivan, RHP; Note : Digital Map consists of Map Data and Traffic Data sub-segments

India Digital Map Services Market (US\$ bn)



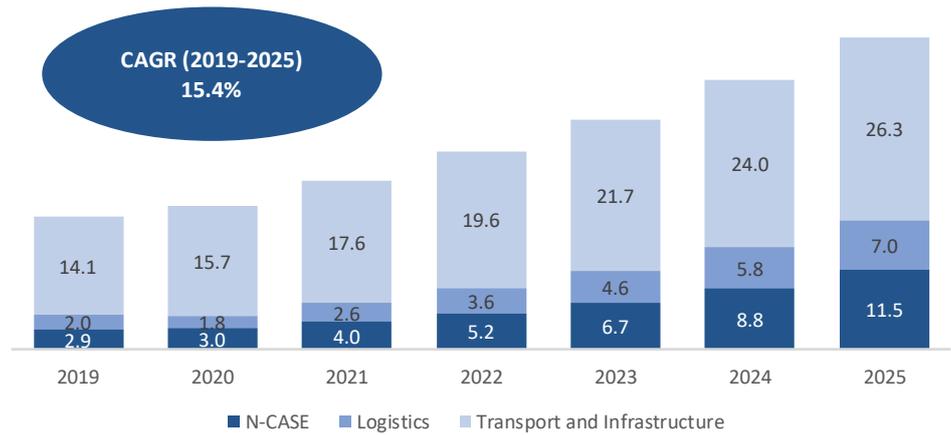
Source: Frost & Sullivan, RHP

Global Mobility Navigations Solutions and Telematics Market (US\$ bn)



Source: Frost & Sullivan, RHP

Indian Mobility Navigations Solutions and Telematics Market (US\$ bn)



Source: Frost & Sullivan, RHP

Multiple use cases across industries



Source: RHP

Competitive landscape – CY20

	TYPE	FOCUS/ STRATEGY	PRODUCTS	KEY CUSTOMERS	GEOGRAPHY
 TomTom	Public Listed Company	Consumer electronics, navigation technology	Devices, Digital Map, Software and Services	Uber, Verizon, Fiat, Volkswagen, Microsoft	Austria, Belgium, Denmark, Finland, France, Germany, Liechtenstein, Luxembourg, Monaco, Norway, Sweden, Switzerland, the Republic of Ireland, the Netherlands and the United Kingdom
 Here Technologies	Private Company	Mapping data, GPS navigation software	Devices, Digital Map, Traffic management solutions, Software and Services	BMW, Mercedes, Volkswagen	~200 countries
 MapBox	Private Company	Maps	Digital Map	New York Times, Lonely Planet, Snapchat, Xiaomi, Land Rover, Skyscanner, Booking.com	Global
 Google Maps	Public Listed Company	Map API's	Google APIs	NA	Global
 ESRI	Private Company	Geo-spatial Solutions	GIS & Mapping Products, Geo Enabled Products, Location Analytics	AT&T, Red Bull, Clearwater Seafoods	Global
 Trimble	Public Listed Company	Geo-spatial Solutions	Geospatial, Construction, Agriculture, Transportation & Logistics, Telecommunications	Warren Averett, LLC, Chesapeake Utilities Corp, Federal Emergency Management Agency	Global
 MapmyIndia	Private Company	Maps, Navigation Systems, Analytics	Map & Data, APIs and SDKs, GIS, Analytics and AI, IoT and Automation, Navigation	Apple Inc. Honda Motors India, Amazon.in, McDonald's, MG, PhonePe	India, Japan, USA

Source: RHP

Competitive landscape – Product mapping, CY20



	MapmyIndia	Google	ESRI	Trimble	Here	TomTom	MapBox
Digital Map and Geospatial Data for India *	✓	✗	✗	✗	✓	✓	✗
Digital Map and Geospatial Data for Rest of World *	P	✗	✗	✗	✓	✓	✗
Map, Location and Navigation Platforms and Products	✓	✓	P	P	✓	✓	✓
Developer APIs and SDKs	✓	✓	P	✗	P	P	P
GIS, Geo analytics and Geo-AI	✓	P	✓	P	✗	✗	✗
Location based IoT, Fleet and Workforce Automation	✓	✗	✗	P	✗	✗	✗
N-CASE Automotive & Mobility Tech	✓	P	✗	✗	P	P	P
Consumer location based apps & IoT	P	✓	✗	✗	✗	✗	✗
Location Powered Consumer Tech & Enterprise Digital Transformation	✓	P	P	P	P	P	P
Location Based Advertising	✗	✓	✗	✗	✗	✗	✓
Geospatial Positioning Infrastructure	✗	✗	✗	✓	P	✗	✗



Offered



Not Offered

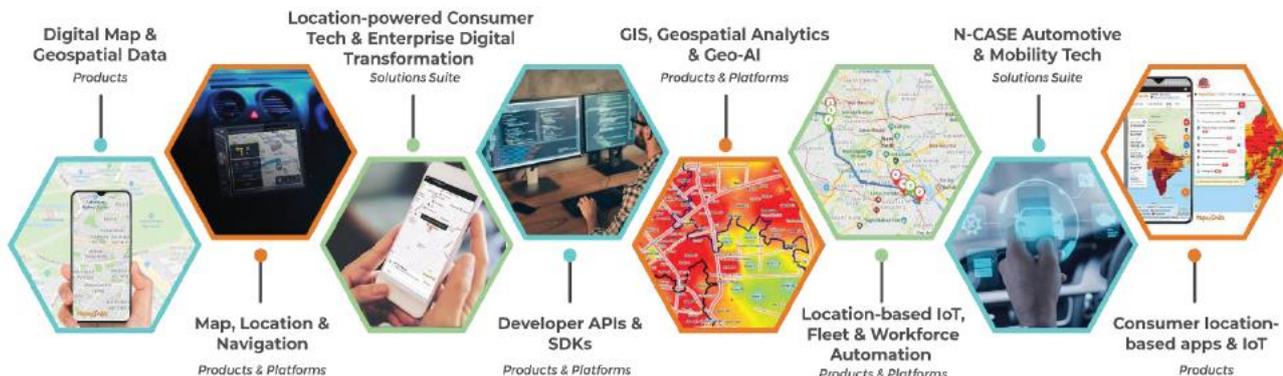


Partial

Source: HTI

MapmyIndia – India’s leading digital mapping solutions provider

MapmyIndia’s map & data and platform & IoT offerings



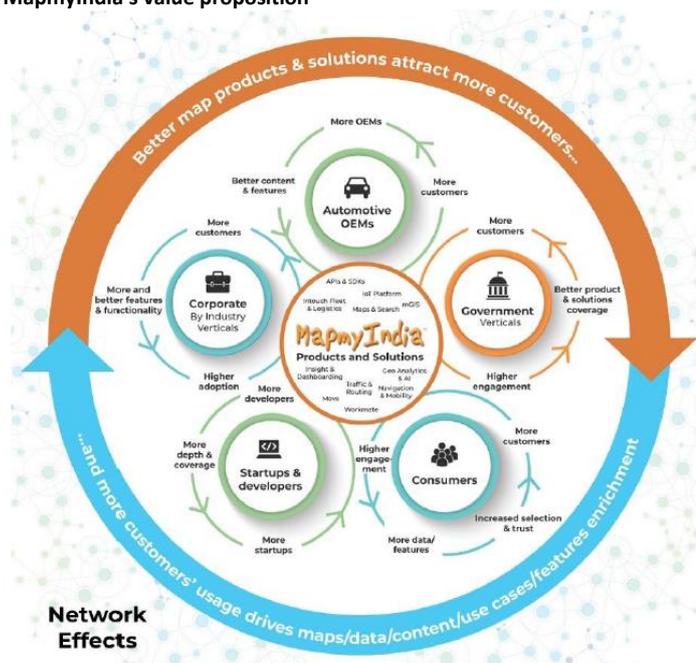
Source: RHP

MapmyIndia’s revenue mix by solutions

	FYE March	FY19	FY20	FY21	HIFY22
Revenue (Rs mn)					
Map and data products		662	887	608	449
Platform and IoT products		691	600	917	551
Revenue mix (%)					
Map and data products		48.9%	59.7%	39.9%	44.9%
Platform and IoT products		51.1%	40.3%	60.1%	55.1%

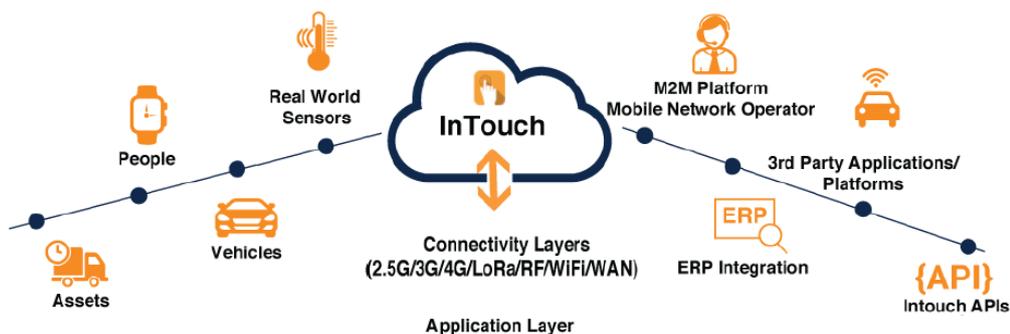
Source: RHP

MapmyIndia’s value proposition



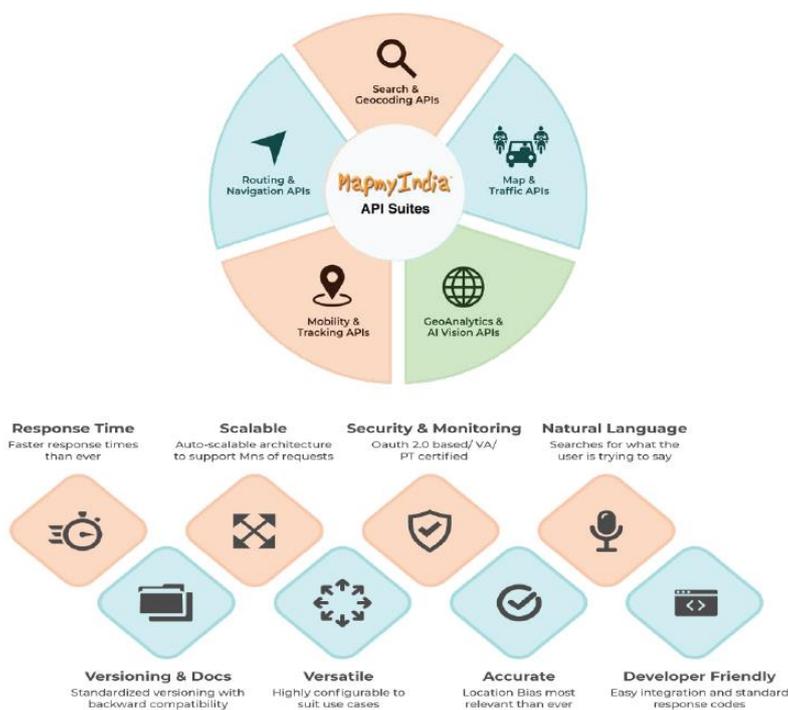
Source: RHP

InTouch – MapmyIndia’s IoT platform



Source: RHP

MapmyIndia’s API suite



Source: RHP

Revenue mix by verticals

FYE March	FY19	FY20	FY21	HIFY22
Revenue (Rs mn)				
Automotive	877	859	672	392
Corporate	367	489	666	537
Government	44	56	140	50
Retail	65	82	47	21
Revenue mix (%)				
Automotive	64.8%	57.8%	44.1%	39.2%
Corporate	27.1%	32.9%	43.7%	53.7%
Government	3.2%	3.8%	9.2%	5.0%
Retail	4.8%	5.5%	3.1%	2.1%

Source: RHP

MapmyIndia's solutions for the Corporate vertical



Source: RHP

MapmyIndia's solutions for the Automotive vertical



MapmyIndia's solutions for the Government vertical



Source: RHP

Board of Directors

Name	Designation	Brief Profile
Rakesh Kumar Verma	Chairman & MD	Mr. Rakesh Verma holds a bachelor degree in mechanical engineering from the BITS, Pilani and an MBA from Eastern Washington University. He co-founded MapmyIndia in 1995 and has significant experience as an entrepreneur in the field of digital maps and geospatial information technologies. He worked for 10 years in the U.S.A. from 1979-1989 in various organisations in their business functions and as faculty, including in EDS (General Motors). He is the FICCI National Committee Chair of Geospatial Technologies. He is also currently a member of the Department of Science and Technology's Legal-sub Committee for the National Geospatial Policy.
Rohan Verma	Whole-time Director & CEO	Mr. Rohan Verma holds a bachelor degree in electrical engineering from Stanford University and an MBA from London Business School. He has experience as an entrepreneur in the digital mapping, geospatial technologies and automotive mobility technologies. He currently serves as a member of the Confederation of Indian Industry National Committee on Space and represents our Company as a core member in the Indian Space Association. He also serves on the Internet and Mobile Association of India's (IAMAI) Logistics Committee. He is an independent director on the board of directors of Cholamandalam Investment and Finance Company.
Rakhi Prasad	Non-Executive Director	Ms. Rakhi Prasad holds a B.S. in computer science from the University of Michigan and a B.A. in economics from the Lady Shri Ram College, University of Delhi. She also holds a master's degree of science in financial engineering from the Columbia University. She has significant experience in the field of finance and technology and has previously worked with Goldman Sachs, Enam Securities, and Matrix Partners. She is currently an investment manager at Alder Capital. She is a member of Bloomberg Women's Buy-side Network and has been featured in the list of India's Top 100 Women in Finance in 2020 by AIWMI.
Sonika Chandra	Non-Executive (Nominee) Director	Ms. Sonika Chandra holds an MBA from the Wharton School of Business, University of Pennsylvania. She has experience in the field of financial services and technology and has previously worked in the U.S.A with Western Union. She is currently a vice president at PhonePe India since March 2020.
Shambhu Singh	Independent Director	Mr. Shambhu Singh holds a master degree in economics from Patna University. He is a retired IAS officer and the last position he held before retirement was Special Secretary and Financial Advisor in Ministry of Road, Transport and Highways, Government of India. He has significant experience in government administrative services and has served on the board of directors of various public sector undertakings such as Central Electronic Limited, Dredging Corporation of India Limited, Shipping Corporation of India Limited, Indian Tourism Development Corporation Limited, and India Port Rail & Ropeway Corporation Limited during his tenure as an IAS officer.
Anil Mahajan	Independent Director	Mr. Anil Mahajan holds a M.A. degree from Punjab University and is member of the Institute of Company Secretaries of India. He has significant experience in the field of corporate affairs and governance, including corporate law and strategy. He is a founding director on the board of Kriti Advisory Services Private Limited, which is engaged in advising corporates in the areas of corporate governance, start-up approvals, and FEMA and GST advisory.
Kartheepan Madasamy	Independent Director	Mr. Kartheepan Madasamy holds a bachelor degree in electronics & communication engineering from Anna University and a master's in electrical engineering from University of Michigan. He also holds an MBA from the University of Chicago. He is an experienced venture capital professional and has a technology background in operations and investments across various technologies such as automation and robotics. He is the founding and managing partner of MFV Partners Management.
Tina Trikha	Independent Director	Ms. Tina Trikha holds a B.S. in economics from MIT, U.S.A., and an MBA from Wharton School of Business, University of Pennsylvania. She is an associate certified coach and holds a certification from the International Coaching Federation. She has experience in the field of finance and strategy and has previously worked with Credit Suisse First Boston, McKinsey & Company, American Express, and Godrej Industries Limited.

Source: RHP

Key management personnel

Name	Designation	Brief Profile
Rakesh Kumar Verma	Chairman & MD	Mr. Rakesh Verma holds a bachelor degree in mechanical engineering from the BITS, Pilani and an MBA from Eastern Washington University. He co-founded MapmyIndia in 1995 and has significant experience as an entrepreneur in the field of digital maps and geospatial information technologies. He worked for 10 years in the U.S.A. from 1979-1989 in various organisations in their business functions and as faculty, including in EDS (General Motors). He is the FICCI National Committee Chair of Geospatial Technologies. He is also currently a member of the Department of Science and Technology's Legal-sub Committee for the National Geospatial Policy.
Rohan Verma	Whole-time Director & CEO	Mr. Rohan Verma holds a bachelor degree in electrical engineering from Stanford University and an MBA from London Business School. He has experience as an entrepreneur in the digital mapping, geospatial technologies and automotive mobility technologies. He currently serves as a member of the Confederation of Indian Industry National Committee on Space and represents our Company as a core member in the Indian Space Association. He also serves on the Internet and Mobile Association of India's (IAMAI) Logistics Committee. He is an independent director on the board of directors of Cholamandalam Investment and Finance Company.
Anuj Kumar Jain	CFO	Mr. Anuj Kumar Jain holds a bachelor degree in commerce from University of Rajasthan. He is a qualified chartered accountant, company secretary and a cost and management accountant and has significant experience in the field of finance, taxation, and accounting. He joined the company as DGM (accounts) in the year 2011. He was subsequently appointed as the company secretary of the company in the year 2011. He was designated as company secretary and acting CFO in the year 2017. In the year 2021, he resigned as company secretary and was designated as the CFO of the company
Saurabh Surendra Somani	CS & Compliance Officer	Mr. Saurabh Surendra Somani holds a bachelor degree in commerce from Nagpur University and diploma in corporate laws from the Indian Law School, Pune. He is a qualified company secretary and has significant experience in the fields of legal, secretarial and listing compliance.
Rashmi Verma	CTO	Ms. Rashmi Verma is the co-founder of the company and holds a bachelor degree in chemical engineering from University of Roorkee and master degree from the Eastern Washington University. She has significant experience as an entrepreneur in the fields of information technology, management, and the geospatial industry, and digital mapping in India. She has been instrumental in the growth of the company and continues to play an active leadership role, in driving the technology initiatives and human resource development. She is responsible for spearheading innovations in the company across AI and geospatial technologies' division.
Shishir Verma	SVP - HR & Corporate Affairs	Mr. Shishir Verma holds a bachelor degree in economics from Patna University and a post graduate diploma in systems development from NIIT. He started his career in the geospatial industry with ESRI in May 2006 and had joined the company on January 17, 2014 as VP - government business. In 2017, he was promoted as SVP to look after corporate affairs and legal. In 2019, he was given the additional responsibility of human resources.
Nikhil Kumar	President - Geospatial	Mr. Nikhil Kumar holds a master degree in electronics from Kurukshetra University. He has been associated with the geospatial industry for a significant number of years and is directly responsible for strategic initiatives and for accelerating the growth of the company's geospatial products, solutions and services in India and abroad. Prior to joining the company, he was Director Strategic Alliances SAARC & SEA at Here Technologies from March 2019 to July 2021. He served at Trimble as a director from July 2013 to March 2019, where he worked in capacity of regional institutional business development director.
Sapna Ahuja	COO	Ms. Sapna Ahuja holds a B.Sc in computer science and M.Sc in applied operations research from University of Delhi. Currently, she is directly responsible for strategic initiatives and for accelerating the growth of company's automotive and mobility business, in addition to her overall responsibility of business operations. In 2004, she worked in our mapmyindia.com product management team. Further, in 2006 she was promoted to AVP and led the development of navigation system and as a VP in 2008, she led the product management and alliances for our maps and data products. She serves on the Road Safety Sub-Committee formed by FICCI.
Ankeet Bhat	CSO	Mr. Ankeet Bhat holds a bachelor degree in electronics and instrumentation engineering (hons.) from BITS, Pilani. He joined as a sales engineer in 2011 and was appointed as VP – business development with effect from April 1, 2016. After his appointment on April 1, 2019 as a SVP, he was responsible for the strategy of the core location platform products and its growth and strategy. Subsequently on April 1, 2021, he was appointed as the chief strategy officer.

Source: RHP

Financial statements

Profit & Loss (Rs mn)	FY19	FY20	FY21	H1FY22
Total Turnover	1,353	1,486	1,525	1,000
Cost of Sales	508	643	540	326
Gross Profit	845	844	985	674
Other Operating costs	590	550	471	222
Total Operating Costs	1,098	1,193	1,011	548
EBITDA	255	294	514	453
D&A	92	98	99	39
EBIT	164	196	415	414
Interest Income	281	148	398	226
Interest Expense	26	28	26	11
Pre Tax Profit	418	316	788	628
Taxation	82	84	193	161
Minority Interest	-	-	-	-
Net Income to ord equity	336	232	594	468

Key Ratios	FY19	FY20	FY21	H1FY22
Growth				
Revenue Growth	N.A.	9.9%	2.6%	81.3%
Operating Profit Growth	N.A.	15.1%	75.1%	558.2%
Net Profit Growth	N.A.	-30.9%	156.2%	161.8%
Margins				
Gross Margin	62.5%	56.8%	64.6%	67.4%
EBIT Margin	12.1%	13.2%	27.2%	41.4%
PreTax Profit Margin	30.9%	21.3%	51.7%	62.8%
Tax Rate	19.7%	26.6%	24.5%	25.6%
Net Profit Margin	24.8%	15.6%	39.0%	46.8%
Return Ratios				
RoE	23.5%	8.0%	18.1%	
RoCE	17.9%	13.9%	24.7%	
Capex/Revenue	-39.5%	-1.3%	0.9%	
Credit Analysis				
EBITDA/Interest Paid	N.M.	N.M.	N.M.	
Net Debt/EBITDA	-0.8	-1.1	-1.3	
Net Debt to Equity	-0.1	-0.1	-0.2	

Source: RHP

Balance Sheet (Rs mn)	FY19	FY20	FY21
Total Cash and equivalents	214	322	672
Inventories	35	44	28
Accounts Receivable	239	311	283
Other Current Assets	1,089	1,035	1,710
Total Current Assets	1,576	1,713	2,692
Tangible Fixed Assets	443	405	328
Intangible Assets	-	-	-
Total Other Assets	1,374	1,461	1,248
Total Non Current Assets	1,816	1,866	1,577
Total Assets	3,393	3,578	4,269
Short Term Debt	-	6	3
Accounts Payable	45	61	45
Other Current Liabilities	271	347	484
Total Current Liabilities	315	414	531
Long Term Debt	-	-	-
Total Non Current Liabilities	225	187	157
Total Liabilities	541	601	689
Common Stock	1,328	1,328	1,328
Shareholders equity	1,524	1,649	2,252
Minority Interest	-	-	-
Other equity	-	-	-
Total Equity	2,852	2,977	3,580
Total liabilities & equity	3,393	3,578	4,269

Cash Flow (Rs mn)	FY19	FY20	FY21
Profit before tax	418	316	788
Cash Flow from Operations	268	267	833
Cash Flow from Investing	(191)	(16)	(593)
Cash flow from Financing	(42)	(188)	(53)
Cash at Beginning	48	83	146
Total Cash Generated	34	64	186
Implied Cash at end	83	146	332

APPENDIX

IMPORTANT DISCLOSURES

This research report is distributed by Haitong International, a global brand name for the equity research teams of Haitong International Research Limited (“HTIRL”), Haitong Securities India Private Limited (“HSIPL”), Haitong International Japan K.K. (“HTIJKK”), Haitong International Securities Company Limited (“HTISCL”), and any other members within the Haitong International Securities Group of Companies (“HTISG”), each authorized to engage in securities activities in its respective jurisdiction.

Analyst Certification:

I, Urmil Shah, certify that (i) the views expressed in this research report accurately reflect my personal views about any or all of the subject companies or issuers referred to in this research and (ii) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report; and that I (including members of my household) have no financial interest in the security or securities of the subject companies discussed.

I, Rounak Ray, certify that (i) the views expressed in this research report accurately reflect my personal views about any or all of the subject companies or issuers referred to in this research and (ii) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report; and that I (including members of my household) have no financial interest in the security or securities of the subject companies discussed.

Conflict of Interest Disclosures

HTI and some of its affiliates may engage in investment banking and / or serve as a market maker or hold proprietary trading positions of certain stocks or companies in this research report. As far as this research report is concerned, the following are the disclosure matters related to such relationship (As the following disclosure does not ensure timeliness and completeness, please send an email to ERD-Disclosure@htisec.com if timely and comprehensive information is needed).

Ratings Definitions (from 1 Jul 2020):

Haitong International uses a relative rating system using Outperform, Neutral, or Underperform for recommending the stocks we cover to investors. Investors should carefully read the definitions of all ratings used in Haitong International Research. In addition, since Haitong International Research contains more complete information concerning the analyst's views, investors should carefully read Haitong International Research, in its entirety, and not infer the contents from the rating alone. In any case, ratings (or research) should not be used or relied upon as investment advice. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations.

Analyst Stock Ratings

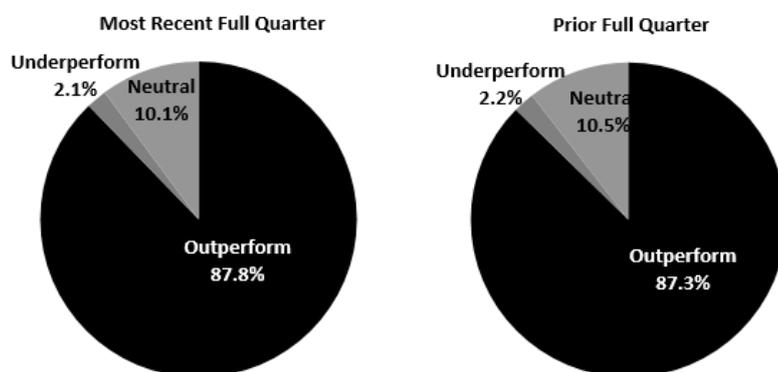
Outperform: The stock's total return over the next 12-18 months is expected to exceed the return of its relevant broad market benchmark, as indicated below.

Neutral: The stock's total return over the next 12-18 months is expected to be in line with the return of its relevant broad market benchmark, as indicated below. For purposes only of FINRA/NYSE ratings distribution rules, our Neutral rating falls into a hold rating category.

Underperform: The stock's total return over the next 12-18 months is expected to be below the return of its relevant broad market benchmark, as indicated below.

Benchmarks for each stock's listed region are as follows: Japan – TOPIX, Korea – KOSPI, Taiwan – TAIEX, India – Nifty100, US – SP500; for all other China-concept stocks – MSCI China.

Rating Distribution



Haitong International Equity Research Ratings Distribution, as of Sep 30, 2021

	Outperform	Neutral (hold)	Underperform
HTI Equity Research Coverage	87.8%	10.1%	2.1%
IB clients*	6.6%	6.6%	7.1%

*Percentage of investment banking clients in each rating category.

BUY, Neutral, and SELL in the above distribution correspond to our current ratings of Outperform, Neutral, and Underperform.

For purposes only of FINRA/NYSE ratings distribution rules, our Neutral rating falls into a hold rating category. Please note that stocks with an NR designation are not included in the table above.

Previous rating system definitions (until 30 Jun 2020):

BUY: The stock's total return over the next 12-18 months is expected to exceed the return of its relevant broad market benchmark, as indicated below.

NEUTRAL: The stock's total return over the next 12-18 months is expected to be in line with the return of its relevant broad market benchmark, as indicated below. For purposes only of FINRA/NYSE ratings distribution rules, our Neutral rating falls into a hold rating category.

SELL: The stock's total return over the next 12-18 months is expected to be below the return of its relevant broad market benchmark, as indicated below.

Benchmarks for each stock's listed region are as follows: Japan – TOPIX, Korea – KOSPI, Taiwan – TAIEX, India – Nifty100; for all other China-concept stocks – MSCI China.

Haitong International Non-Rated Research: Haitong International publishes quantitative, screening or short reports which may rank stocks according to valuation and other metrics or may suggest prices based on possible valuation multiples. Such rankings or suggested prices do not purport to be stock ratings or target prices or fundamental values and are for information only.

Haitong International Coverage of A-Shares: Haitong International may cover and rate A-Shares that are subject to the Hong Kong Stock Connect scheme with Shanghai and Shenzhen. Haitong Securities (HS; 600837 CH), the ultimate parent company of HTISG based in Shanghai, covers and publishes research on these same A-Shares for distribution in mainland China. However, the rating system employed by HS differs from that used by HTI and as a result there may be a difference in the HTI and HS ratings for the same A-share stocks.

Haitong International Quality 100 A-share (Q100) Index: HTI's Q100 Index is a quant product that consists of 100 of the highest-quality A-shares under coverage at HS in Shanghai. These stocks are carefully selected through a quality-based screening process in combination with a review of the HS A-share team's bottom-up research. The Q100 constituent companies are reviewed quarterly.

MSCI ESG Disclaimer: Although Haitong International's information providers, including without limitation, MSCI ESG Research LLC and its affiliates (the "ESG Parties"), obtain information (the "Information") from sources they consider reliable, none of the ESG Parties warrants or guarantees the originality, accuracy and/or completeness, of any data herein and expressly disclaim all express or implied warranties, including those of merchantability and fitness for a particular purpose. The Information may only be used for your internal use, may not be reproduced or disseminated in any form and may not be used as a basis for, or a component of, any financial instruments or products or indices. Further, none of the Information can in and of itself be used to determine which securities to buy or sell or when to buy or sell them. None of the ESG Parties shall have any liability for any errors or omissions in connection with any data herein, or any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

SusallWave FIN-ESG Data Service Disclaimer: Please read these terms and conditions below carefully and confirm your agreement and acceptance with these terms before using SusallWave FIN-ESG Data Service.

1. FIN-ESG Data is produced by SusallWave Digital Technology Co., Ltd. (In short, SusallWave)'s assessment based on legal publicly accessible information. SusallWave shall not be responsible for any accuracy and completeness of the information. The assessment result is for reference only. It is not for any investment advice for any individual or institution and not for basis of purchasing, selling or holding any relative financial products. We will not be liable for any direct or indirect loss of any individual or institution as a result of using SusallWave FIN-ESG Data.
2. SusallWave do not consider recipients as customers for receiving these data. When using the data, recipients shall make your own independent judgment according to your practical individual status. The contents of the data reflect the judgment of us only on the release day. We have right to update and amend the data and release other data that contains inconsistent contents or different conclusions without notification. Unless expressly stated, the data (e.g., financial performance data) represents past performance only and the past performance cannot be viewed as the prediction of future return.
3. The copyright of this data belongs to SusallWave, and we reserve all rights in accordance with the law. Without the prior written permission of our company, none of individual or institution can use these data for any profitable purpose. Besides, none of individual or institution can take actions such as amendment, replication, translation, compilation, re-editing, adaption, deletion, abbreviation, excerpts, issuance, rent, exhibition, performance, projection, broadcast, information network transmission, shooting, adding icons and instructions. If any loss of SusallWave or any third-party is caused by those actions, users shall bear the corresponding compensation liability. SusallWave shall not be responsible for any loss.
4. If any term is not contained in this disclaimer but written in other agreements on our website (e.g. *User Registration Protocol of SusallWave Website, User Service (including authentication) Agreement of SusallWave Website, Privacy Policy of Susallwave Website*), it should be executed according to other agreements. If there is any difference between this disclaimer and other agreements, this disclaimer shall be applied.

IMPORTANT DISCLAIMER

For research reports on non-Indian securities: The research report is issued by Haitong International Research Limited ("HTIRL"), a wholly owned subsidiary of Haitong International Securities Group Limited ("HTISGL") and a licensed corporation to carry on Type 4 regulated activity (advising on securities) for the purpose of the Securities and Futures Ordinance (Cap. 571) of Hong Kong, with the assistance of Haitong International (Japan) K.K. ("HTIJKK"), a wholly owned subsidiary of HTISGL and which is regulated as an Investment Adviser by the Kanto Finance Bureau of Japan.

For research reports on Indian securities: The research report is issued by Haitong Securities India Private Limited ("HSIPL"), an Indian company and a Securities and Exchange Board of India ("SEBI") registered Stock Broker, Merchant Banker and Research Analyst that, inter alia, produces and distributes research reports covering listed entities on the BSE Limited ("BSE") and the National Stock Exchange of India Limited ("NSE") (collectively referred to as "Indian Exchanges"). HSIPL was acquired and became part of the Haitong International Securities Group of Companies ("HTISG") on 22 December 2016.

All the research reports are globally branded under the name Haitong International and approved for distribution by Haitong International Securities Company Limited ("HTISCL") and/or any other members within HTISG in their respective jurisdictions.

The information and opinions contained in this research report have been compiled or arrived at from sources believed to be reliable and in good faith but no representation or warranty, express or implied, is made by HTIRL, HTISCL, HSIPL, HTIJKK or any other members within HTISG from which this research report may be received, as to their accuracy, completeness or correctness. All opinions expressed herein are as of the date of this research report and are subject to change without notice. This research report is for information purpose only. Descriptions of any companies or their securities mentioned herein are not intended to be complete and this research report is not, and should not be construed expressly or impliedly as, an offer to buy or sell securities. The securities referred to in this research report may not be eligible for purchase or sale in some jurisdictions. If an investment product is denominated in a currency other than an investor's home currency, a change in exchange rates may adversely affect the investment. Past performance is not necessarily indicative of future results. Certain transactions, including those involving derivatives, give rise to

substantial risk and are not suitable for all investors. You should also bear in mind that recommendations in this research report are not tailor-made for you. The analyst has not taken into account your unique financial circumstances, such as your financial situation and risk appetite. You must, therefore, analyze and should, where applicable, consult your own legal, tax, accounting, financial and other professional advisers to evaluate whether the recommendations suits you before investment. Neither HTISG nor any of its directors, employees or agents accepts any liability whatsoever for any direct or consequential loss arising from any use of the materials contained in this research report.

HTISG and our affiliates, officers, directors, and employees, excluding the analysts responsible for the content of this document, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research report. Sales, traders, and other professionals of HTISG may provide oral or written market commentary or trading strategies to the relevant clients and the companies within HTISG that reflect opinions that are contrary to the opinions expressed in this research report. HTISG may make investment decisions that are inconsistent with the recommendations or views expressed in this research report. HTI is under no obligation to ensure that such other trading decisions, ideas or recommendations are brought to the attention of any recipient of this research report.

Please refer to HTI's website www.equities.htisec.com for further information on HTI's organizational and administrative arrangements set up for the prevention and avoidance of conflicts of interest with respect to Research.

Non U.S. Analyst Disclosure: The HTI analyst(s) listed on the cover of this Research is (are) not registered or qualified as a research analyst with FINRA and are not subject to U.S. FINRA Rule 2241 restrictions on communications with companies that are the subject of the Research; public appearances; and trading securities by a research analyst.

DISTRIBUTION AND REGIONAL NOTICES

Except as otherwise indicated below, any Recipient wishing to discuss this research report or effect any transaction in any security discussed in HTI's research should contact the Haitong International salesperson in their own country or region.

Notice to Hong Kong investors: The research report is distributed by Haitong International Securities Company Limited ("HTISCL"), which is a licensed corporation to carry on Type 1 regulated activity (dealing in securities) in Hong Kong. This research report does not constitute a solicitation or an offer of securities or an invitation to the public within the meaning of the SFO. This research report is only to be circulated to "Professional Investors" as defined in the SFO. This research report has not been reviewed by the Securities and Futures Commission. You should not make investment decisions solely on the basis of the information contained in this research report. Recipients of this research report are to contact HTISCL salespersons in respect of any matters arising from, or in connection with, the research report.

Notice to U.S. investors: As described above, this research report was prepared by HTIRL, HSIPL or HTIJKK. Neither HTIRL, HSIPL, HTIJKK, nor any of the non U.S. HTISG affiliates is registered in the United States and, therefore, is not subject to U.S. rules regarding the preparation of research reports and the independence of research analysts. This research report is provided for distribution to "major U.S. institutional investors" and "U.S. institutional investors" in reliance on the exemption from registration provided by Rule 15a-6 of the U.S. Securities Exchange Act of 1934, as amended. When distributing research reports to "U.S. institutional investors," HTI USA will accept the responsibilities for the content of the reports. Any U.S. recipient of this research report wishing to effect any transaction to buy or sell securities or related financial instruments based on the information provided in this research report should do so only through Haitong International Securities (USA) Inc. ("HTI USA"), located at 340 Madison Avenue, 12th Floor, New York, NY 10173, USA; telephone (212) 351 6050. HTI USA is a broker-dealer registered in the U.S. with the U.S. Securities and Exchange Commission (the "SEC") and a member of the Financial Industry Regulatory Authority, Inc. ("FINRA"). HTI USA is not responsible for the preparation of this research report nor for the analysis contained therein. Under no circumstances should any U.S. recipient of this research report contact the analyst directly or effect any transaction to buy or sell securities or related financial instruments directly through HSIPL, HTIRL or HTIJKK. The HSIPL, HTIRL or HTIJKK analyst(s) whose name appears in this research report is not registered or qualified as a research analyst with FINRA and, therefore, may not be subject to FINRA Rule 2241 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account. Investing in any non-U.S. securities or related financial instruments (including ADRs) discussed in this research report may present certain risks. The securities of non-U.S. issuers may not be registered with, or be subject to U.S. regulations. Information on such non-U.S. securities or related financial instruments may be limited. Foreign companies may not be subject to audit and reporting standards and regulatory requirements comparable to those in effect within the U.S. The value of any investment or income from any securities or related financial instruments discussed in this research report denominated in a currency other than U.S. dollars is subject to exchange rate fluctuations that may have a positive or adverse effect on the value of or income from such securities or related financial instruments. All inquiries by U.S. recipients should be directed to:

Haitong International Securities (USA) Inc.
340 Madison Avenue, 12th Floor
New York, NY 10173
Attn: Sales Desk at (212) 351 6050

People's Republic of China (PRC): In the PRC, the research report is directed for the sole use of those who receive the research report in accordance with the applicable PRC laws and regulations. Further, the information on the research report does not constitute "production and business activities in the PRC" under relevant PRC laws. This research report does not constitute a public offer of the security, whether by sale or subscription, in the PRC. Further, no legal or natural persons of the PRC may directly or indirectly purchase any of the security or any beneficial interest therein without obtaining all prior PRC government approvals or licenses that are required, whether statutorily or otherwise. Persons who come into possession of this research are required to observe these restrictions.

Notice to Canadian Investors: Under no circumstances is this research report to be construed as an offer to sell securities or as a solicitation of an offer to buy securities in any jurisdiction of Canada. Any offer or sale of the securities described herein in Canada will be made only under an exemption from the requirements to file a prospectus with the relevant Canadian securities regulators and only by Haitong International Securities (USA) Inc., a dealer relying on the "international dealer exemption" under National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations ("NI 31-103") in Alberta, British Columbia, Ontario and Quebec. This research report is not, and under no circumstances should be construed as, a prospectus, an offering memorandum, an advertisement or a public offering of any securities in Canada. No securities commission or similar regulatory authority in Canada has reviewed or in any way passed upon this research report, the information contained herein or the merits of the securities described herein and any representation to the contrary is an offence. Upon receipt of this research report, each Canadian recipient will be deemed to have represented that the investor is an "accredited investor" as such term is defined in section 1.1 of National Instrument 45-106 Prospectus Exemptions or, in Ontario, in section 73.3(1) of the Securities Act (Ontario), as applicable, and a "permitted client" as such term is defined in section 1.1 of NI 31-103, respectively.

Notice to Singapore investors: This research report is provided in Singapore by or through Haitong International Securities (Singapore) Pte Ltd ("HTISSPL") [Co Reg No 201311400G. HTISSPL is an

Exempt Financial Adviser under the Financial Advisers Act (Cap. 110) ("FAA") to (a) advise on securities, units in a collective investment scheme, exchange-traded derivatives contracts and over-the-counter derivatives contracts and (b) issue or promulgate research analyses or research reports on securities, exchange-traded derivatives contracts and over-the-counter derivatives contracts. This research report is only provided to institutional investors, within the meaning of Section 4A of the Securities and Futures Act (Cap. 289). Recipients of this research report are to contact HTISSPL via the details below in respect of any matters arising from, or in connection with, the research report:

Haitong International Securities (Singapore) Pte. Ltd.

10 Collyer Quay, #19-01 - #19-05 Ocean Financial Centre, Singapore 049315

Telephone: (65) 6536 1920

Notice to Japanese investors: This research report is distributed by Haitong International Securities Company Limited and intended to be distributed to Financial Services Providers or Registered Financial Institutions engaged in investment management (as defined in the Japan Financial Instruments and Exchange Act ("FIEL") Art. 61(1), Order for Enforcement of FIEL Art. 17-11(1), and related articles).

Notice to UK and European Union investors: This research report is distributed by Haitong International Securities Company Limited. This research is directed at persons having professional experience in matters relating to investments. Any investment or investment activity to which this research relates is available only to such persons or will be engaged in only with such persons. Persons who do not have professional experience in matters relating to investments should not rely on this research. Haitong International Securities Company Limited's affiliates may have a net long or short financial interest in excess of 0.5% of the total issued share capital of the entities mentioned in this research report. Please be aware that any report in English may have been published previously in Chinese or another language.

Notice to Australian investors: The research report is distributed in Australia by Haitong International Securities (Singapore) Pte Ltd, Haitong International Securities Company Limited, and Haitong International Securities (UK) Limited in reliance on ASIC Corporations (Repeal and Transitional) Instrument 2016/396, which exempts those HTISG entities from the requirement to hold an Australian financial services license under the Corporations Act 2001 in respect of the financial services it provides to wholesale clients in Australia. A copy of the ASIC Class Orders may be obtained at the following website, www.legislation.gov.au. Financial services provided by Haitong International Securities (Singapore) Pte Ltd, Haitong International Securities Company Limited, and Haitong International Securities (UK) Limited are regulated under foreign laws and regulatory requirements, which are different from the laws applying in Australia.

Notice to Indian investors: The research report is distributed by Haitong Securities India Private Limited ("HSIPL"), an Indian company and a Securities and Exchange Board of India ("SEBI") registered Stock Broker, Merchant Banker and Research Analyst that, inter alia, produces and distributes research reports covering listed entities on the BSE Limited ("BSE") and the National Stock Exchange of India Limited ("NSE") (collectively referred to as "Indian Exchanges").

This research report is intended for the recipients only and may not be reproduced or redistributed without the written consent of an authorized signatory of HTISG.

Copyright: Haitong International Securities Group Limited 2019. All rights reserved.

<http://equities.htisec.com/x/legal.html>
