

Zinnov Zones 2018

ER&D Services

December 2018



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ER&D Services Market Overview

02

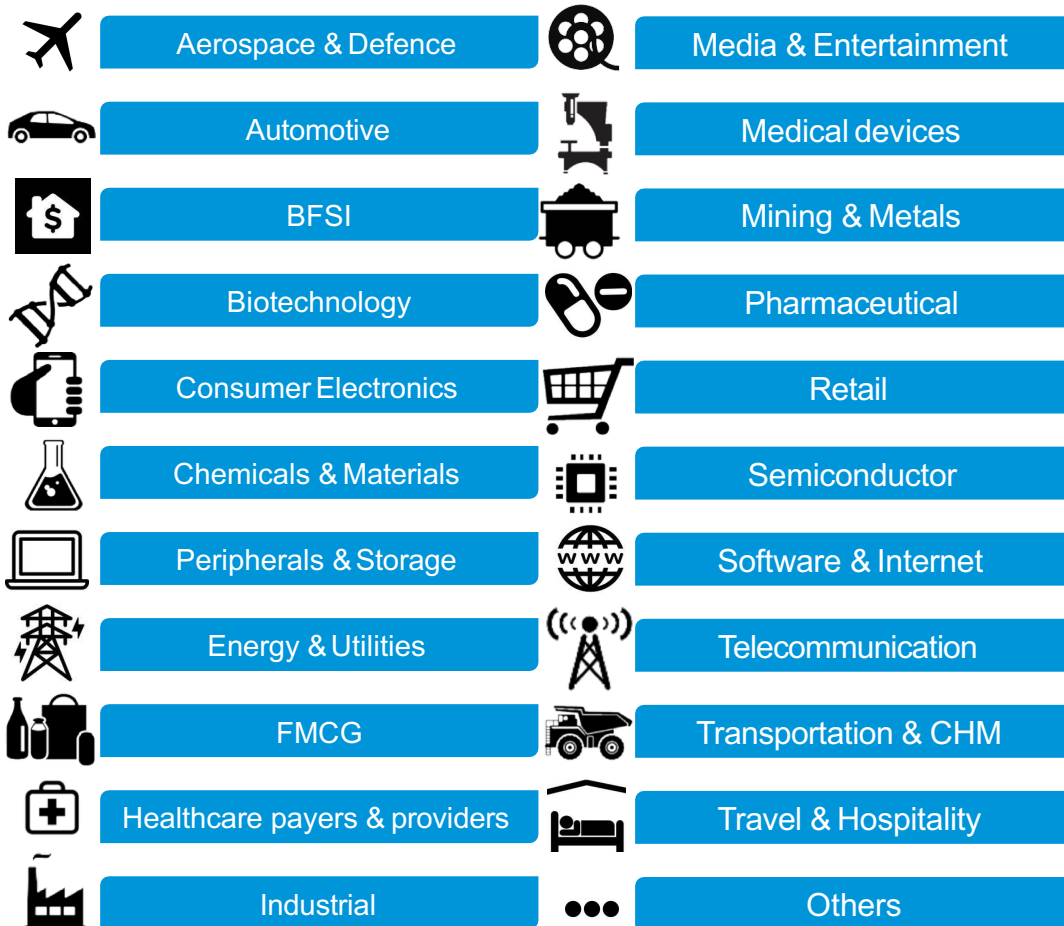
Zinnov Zones ER&D Service provider Ratings 2018

- Global Corporate ER&D Spend
 - ▼ Z1000 R&D Spend by vertical
- Overall Digital Engineering Spend
 - ▼ Digital engineering spend by vertical

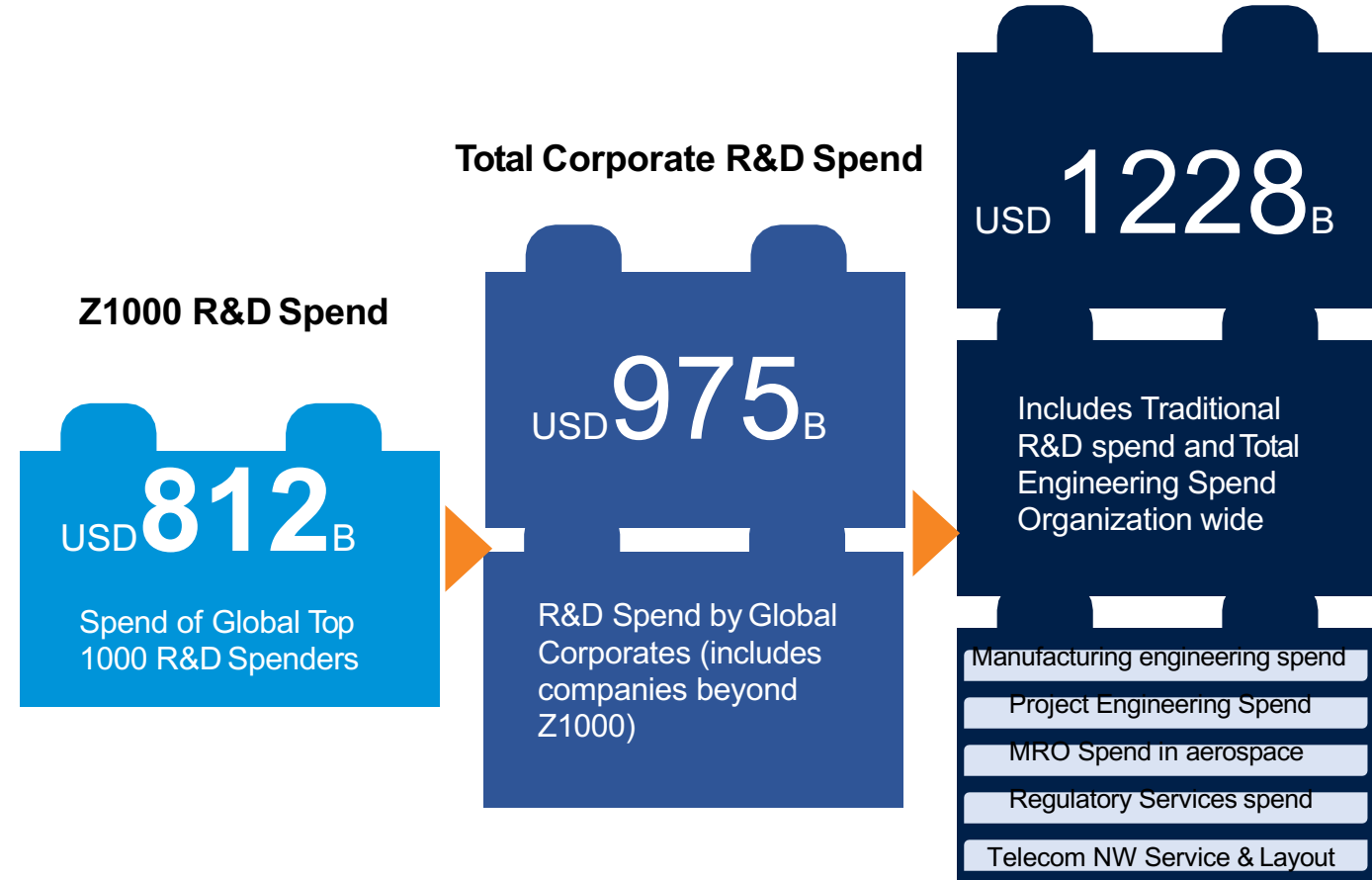
The Global Corporate ER&D Spend is pegged at USD 1.2 trillion

Global Corporate Engineering and R&D Spend is in excess of **USD 1.2 Trillion** in 2018

Z1000 organizations



Total Corporate ER&D Spend



Zinnov has increased its coverage through new verticals such as BFSI, Retail, and Travel & Hospitality, etc. which reflects as increased Corporate ER&D spend

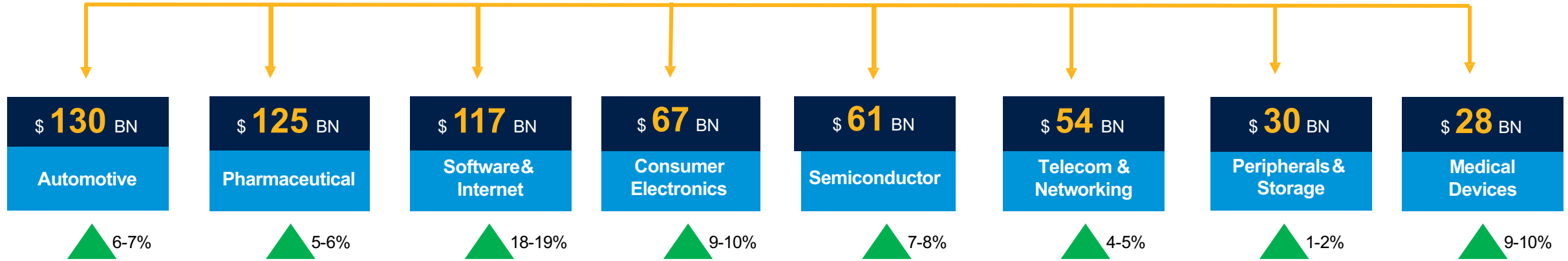
While automotive firms lead R&D spending, Software & Internet firms have witnessed highest growth (1/2)

Z1000 organizations

USD **812** Billion

2018

X% Increase in R&D spend over 2017
 Y% decrease in R&D spend over 2017
 Z1000 R&D



Top R&D Spenders

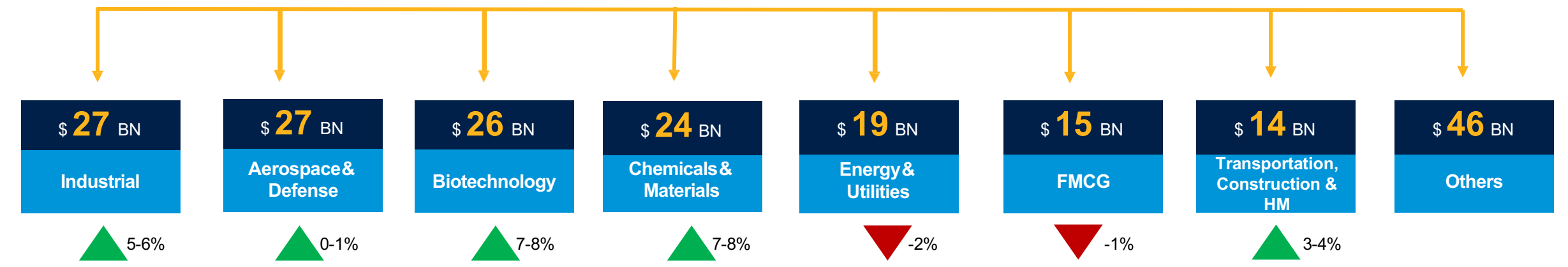
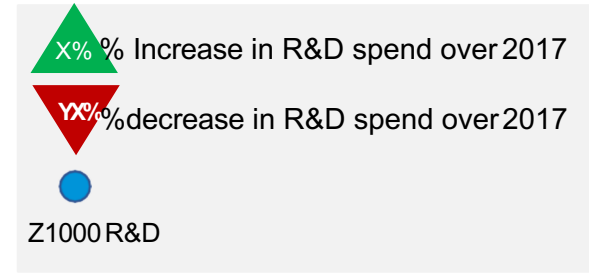
Volkswagen	14.5B	Merck & Co.	10.2B	Amazon	22.6B	Apple	14.2B	Intel	13.1B	Huawei	13.5B	Dell Technologies	4.3B	Medtronic	2.2B
Daimler	9.6B	Novartis	8.9B	Alphabet	16.6B	Samsung Electronics	14.1B	Qualcomm	5.6B	Cisco Systems	6.3B	Canon	2.7B	Bard	1B
Toyota Motor	9.5B	Pfizer	7.7B	Microsoft	13B	Sony	4.1B	Broadcom	3.3B	Nokia	5.4B	Western Digital	2.4B	Becton Dickinson	1B
Robert Bosch	8B	Bristol-Myers Squibb	6.4B	Facebook	7.7B	Panasonic	4.1B	TSMC	2.5B	Ericsson	4.4B	Lenovo	1.2B	Boston Scientific	1B
Ford Motor	8B	GlaxoSmithKline	6.1B	Oracle	6.2B	FujiFilm	1.5B	Veracore	2.1B	NTI	1.9B	Seagate	1B	Thermo Fisher Scientific	0.9B

While automotive firms lead R&D spending, software & Internet firms have witnessed highest growth (2/2)

Z1000 organizations

USD **812** Billion

2018



Top R&D Spenders

ABB	1.3B	Boeing	3.2B	Celgene	5.9B	Dupont	2.1B	Petrochina	1.8B	Procter & Gamble	1.8B	Caterpillar	1.9B
Sumitomo Electric	1.1B	Airbus	3.1B	Gilead Sciences	3.7B	BASF	2.1B	SNAM	1.1B	Nestle	1.7B	China Railway Construction	1.5B
TDK	0.9B	BAE Systems	2.1B	Amgen	3.5B	3M	1.8B	ExxonMobil	1.1B	Unilever	1B	CRRC	1.5B
Murata Manufacturing	0.8B	Leonardo-Finmeccanica	1.7B	Biogen	2.2B	Dow Chemical	1.6B	Sinopec	0.9B	L'oreal	1B	Deere & Company	1.4B
Toyota Industries	0.7B	Safran	1.5B	Monsanto	1.6B	Sumitomo Chemical	1.5B	Royal Dutch	0.9B	Pepsico	0.7B	CNH	1B

Digital natives have been disrupting large R&D spenders across verticals...

<u>Traditional Products</u>	<u>Industries</u>	<u>Digital Products</u>		<u>Early adopters to drive digitization</u>
Car Sales	Automotive	Shared Mobility	UBER	<ul style="list-style-type: none"> Ride sharing company UBER has a higher valuation than GM and Ford Tesla focuses on building autonomous EVs
		Autonomous and EVs	TESLA	
Equipment	Industrial	Industrial Analytics	Honeywell	<ul style="list-style-type: none"> Honeywell built its Sentience platform and provides analytics services to its clients PTC acquired Thoughtworks to provide platform services to its clients
		Platform	ptc	
Oil Production	Energy	Predictive maintenance	GE Aviation	<ul style="list-style-type: none"> Taleris uses sensors to monitor aircraft components & systems and provide predictive maintenance services for customers KUKA produces one unpainted vehicle body every 77 seconds
		Operational efficiency	KUKA	
Medical Devices Medicines	Healthcare	On-Demand	practo	<ul style="list-style-type: none"> Practo Became world's largest health appointment booking platform in 2015 CareFusion is shifting to patient centric model
		Connected Devices	CareFusion	
Telecom Equipment Network Infra	Telecom	Software defined networks	WhatsApp	<ul style="list-style-type: none"> Over 1 Bn active users with 42 Bn+ texts sent daily The industry expects to lose combined \$386 Bn between 2012 and 2018 to OTT players such as Skype
		Over the top services	skype	
On-premise applications	Enterprise Software	Software as a service	salesforce	<ul style="list-style-type: none"> Salesforce.com transformed the CRM business by providing cloud based services Salesforce.com has captured 20% of the market share Slack is valued at \$5 billion and transformed enterprise collaboration
		Mobility	# slack	
Embedded Design	Consumer	Product personalization	Spotify	<ul style="list-style-type: none"> Spotify quadrupled its paying user base (40 Mn+) in just 2 years Facebook uses consumer data to define product roadmaps 1.2B+ people use Facebook
		Data driven product engineering	facebook	

Top R&D spenders are investing in digital engineering themes to drive velocity in manufacturing processes and new product development while also enabling alternate revenue streams

- 
- ✓ Faster product development
 - ✓ Enhanced quality checks
 - ✓ Automated production lines

Spend on digital infrastructure

Engineering and R&D spend to build digital infrastructure:

- Includes spend on digitally modernizing the product launch and development process (ex. Factory 4.0)
- Includes spend on new digital technologies on modern infrastructure such as AR/VR and AI

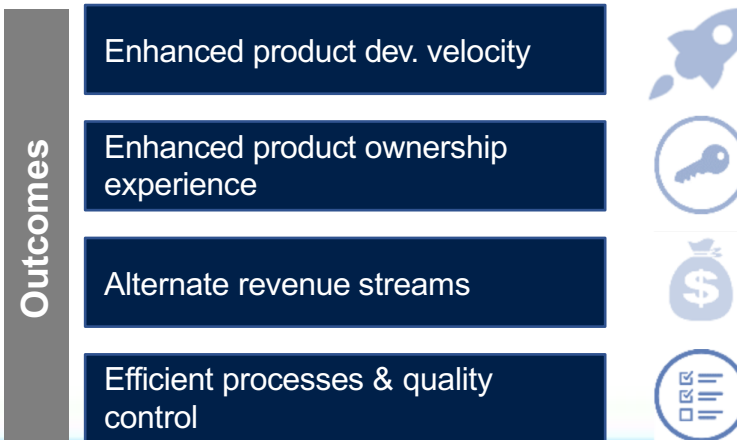
Digital engineering spend

Spend on enabling new products

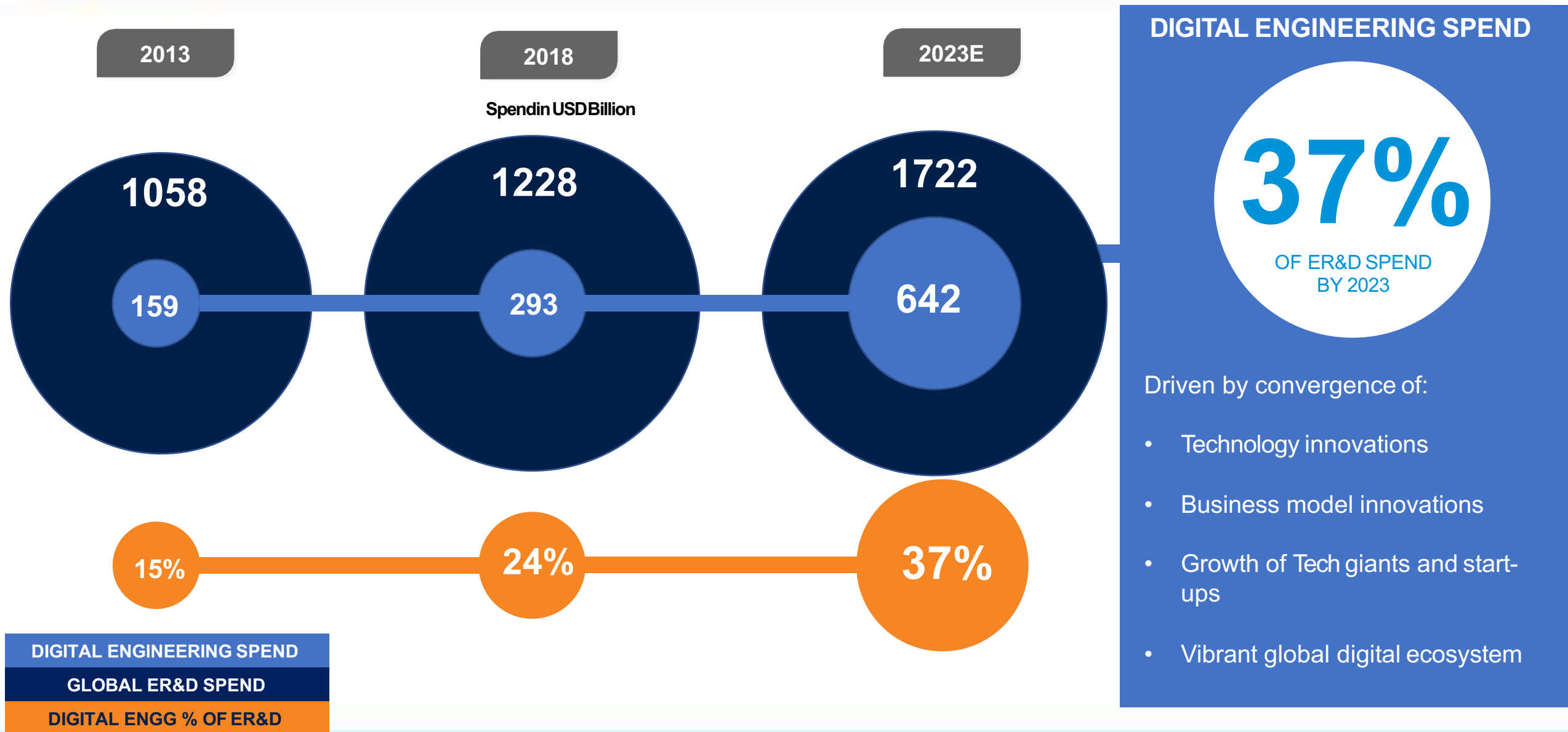
Engineering and R&D Spend to build:

- New and connected products such as connected cars, wearables, smart lighting, etc.
- New services such as predictive asset maintenance, remote diagnostics, etc.

- 
- ✓ Enhanced new product portfolio
 - ✓ Recurring revenue streams through subscription models

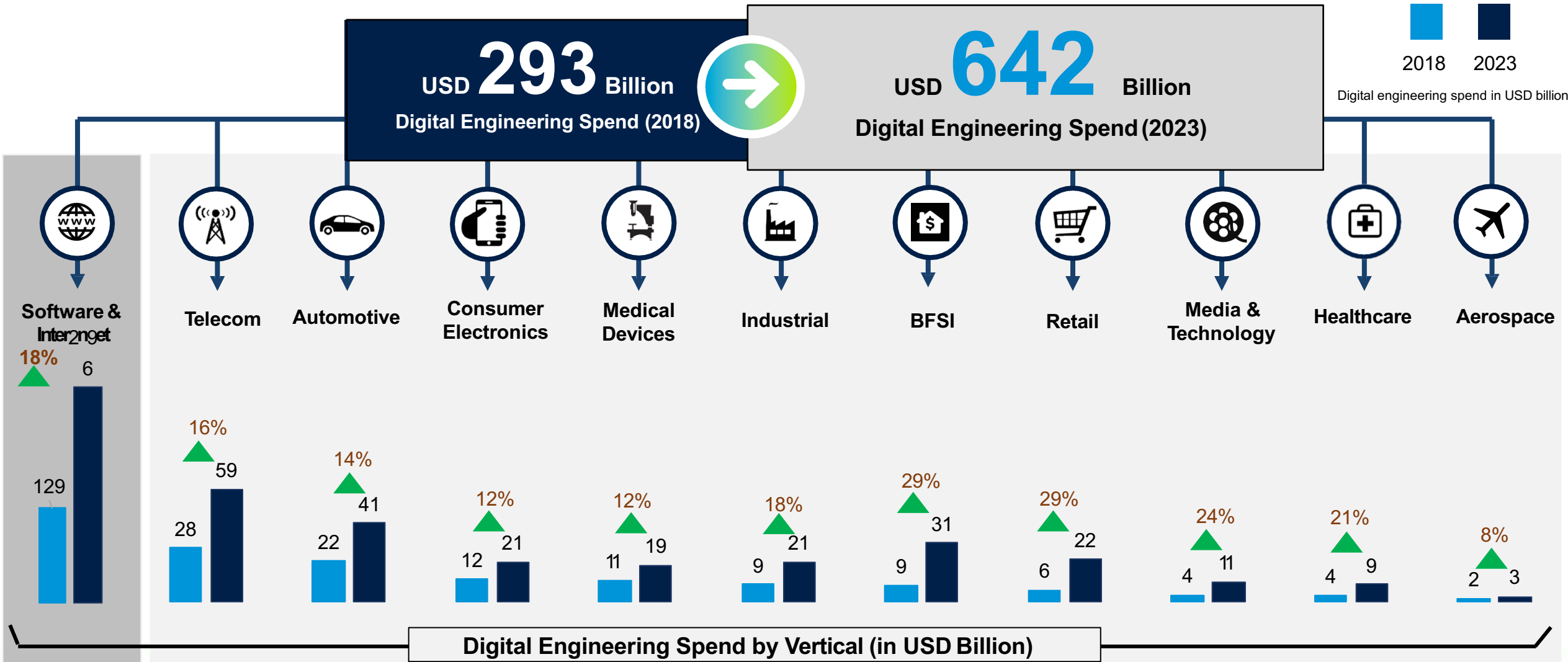


Digital engineering spend is expected to account for 37% of ER&D Spending by 2023



Across industries, digital engineering will drive future ER&D growth

Digital Engineering Spend Across Industries



Digital Engineering Spend Across Geographies



Digital Spend

58%

North American enterprises account for 58% of the digital engineering spend driven by increased R&D spending by Software & Internet firms (Tech Mafia).

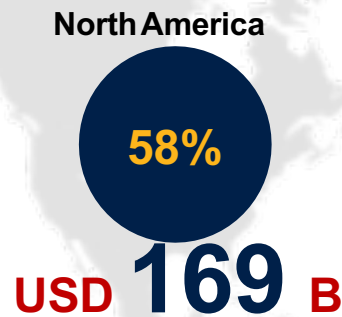


Chinese Enterprises

6/10

There are 6 Chinese enterprises amongst the top digital engineering 10 spenders in the APAC region

More than one-thirds of the digital engineering spend in APAC is accounted for by Chinese enterprises



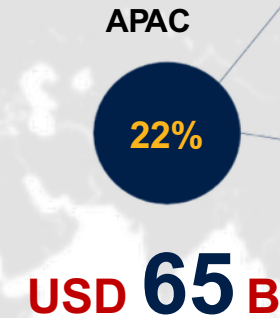
Top Spenders

- Alphabet
- Apple
- Amazon
- Cisco
- Facebook
- IBM
- Intel
- Microsoft
- Oracle
- VMware



Top Spenders

- AstraZeneca
- BMW
- Daimler AG
- Ericsson
- Nokia
- Novartis
- Robert Bosch
- Roche
- SAP
- Volkswagen



Top Spenders

- Alibaba
- Baidu
- Ctrip
- Honda
- Huawei
- Samsung
- Tencent
- Toyota
- Zte
- NTT

China accounts for 1/3rd of APAC digital engineering spend



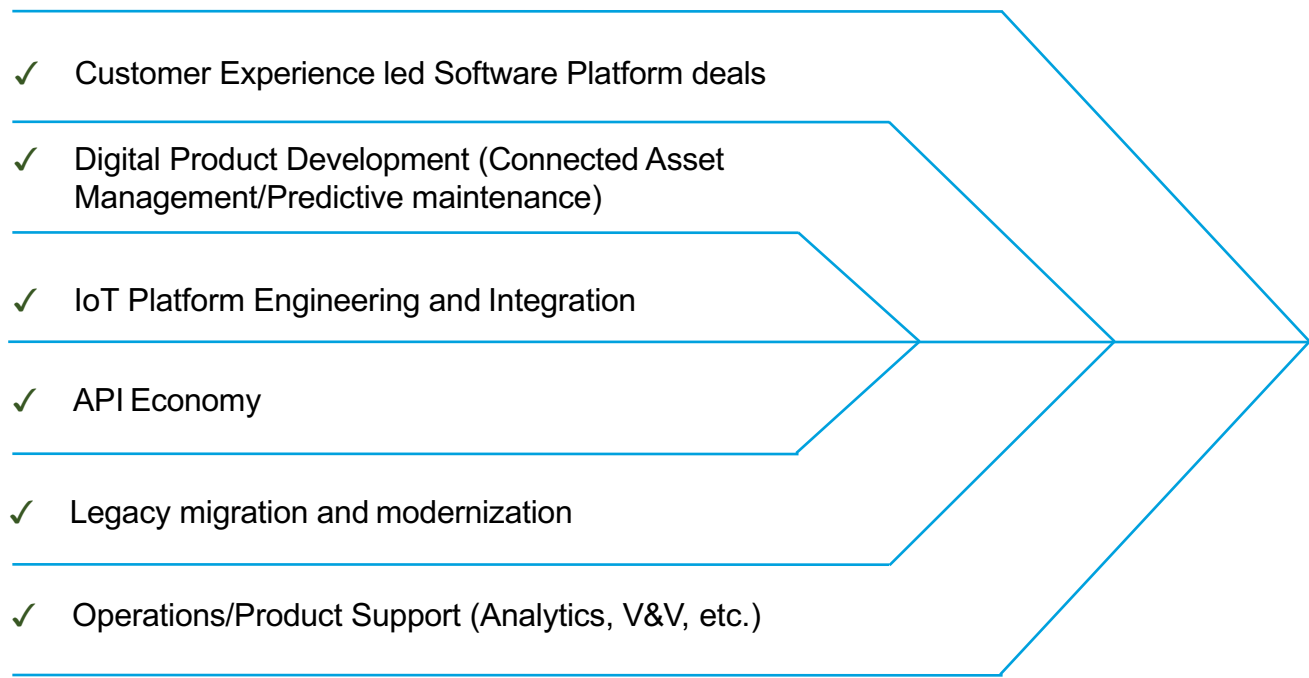
X% % of global digital engineering spending

Digital engineering is seen as a means to “Renew the Old” and “Build the New” by R&D spenders

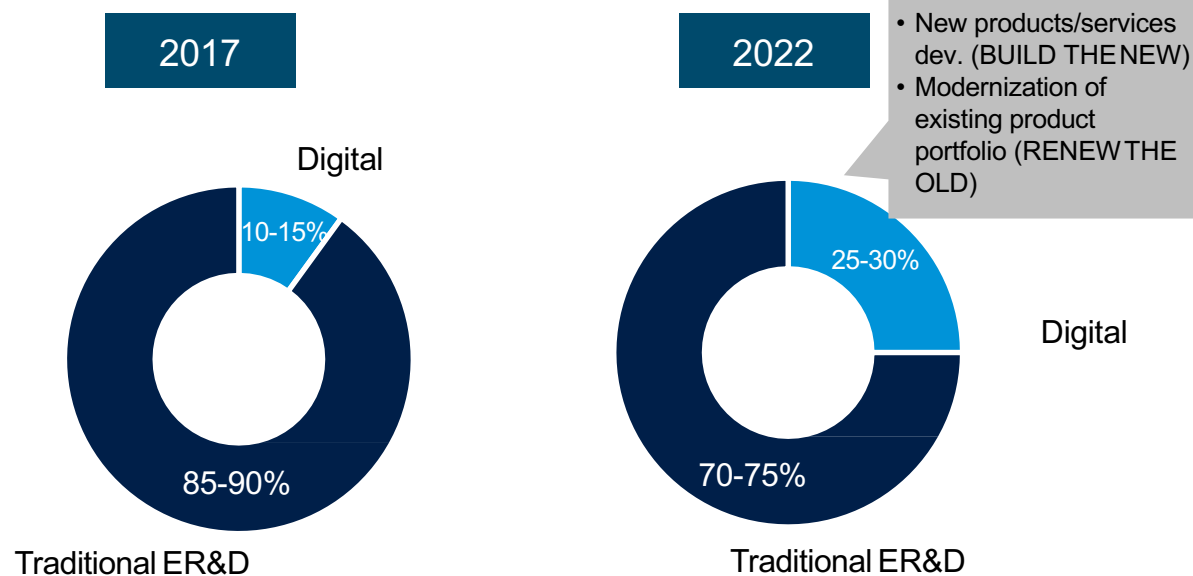
		Digital Engineering spend	
		Modernization of product development process “RENEW THE OLD”	New/Connected Products and Services “BUILD THE NEW”
	Automotive	<ul style="list-style-type: none"> • Robotic automation in plants • 3D printing for components • Digital PLM 	<ul style="list-style-type: none"> • Autonomous vehicles • Connected vehicles • ADAS
	Consumer electronics	<ul style="list-style-type: none"> • Digital modernization of product launch/development process • Digital tools/feedback for design 	<ul style="list-style-type: none"> • Connected & smart devices • Platformization
	Industrial	<ul style="list-style-type: none"> • Factory 4.0 and plant automation • Digital Twins • 3D Printing 	<ul style="list-style-type: none"> • Predictive asset maintenance • Connected equipment
	Medical devices & HLS	<ul style="list-style-type: none"> • Drug manufacturing and plant automation • Robotic surgery 	<ul style="list-style-type: none"> • Wearables for monitoring • Preventive healthcare
	Software & Internet	<ul style="list-style-type: none"> • Modernization of product portfolio (Cloud engineering) • Agile and DevOps engineering 	<ul style="list-style-type: none"> • New products and platform (SaaS, PaaS) • IoT platforms • AI and ML software • DevOps platforms
	Telecom & Networking	<ul style="list-style-type: none"> • SDN • NFV • RPA 	<ul style="list-style-type: none"> • Digital VAS • Data monetization

Large R&D spenders will increasingly leverage the ER&D service provider community to drive transformation through digital engineering

Drivers for digital engineering led deals



Share of digital engineering deals



Large R&D spenders are leveraging the ER&D service provider community for transformation. ER&D Spenders have opportunities across:

- “Manage the Old” – Product carveouts, IP Partnerships, etc.
- “Renew the Old” – Modernization initiatives
- “Build the New” – Enabling new products and services



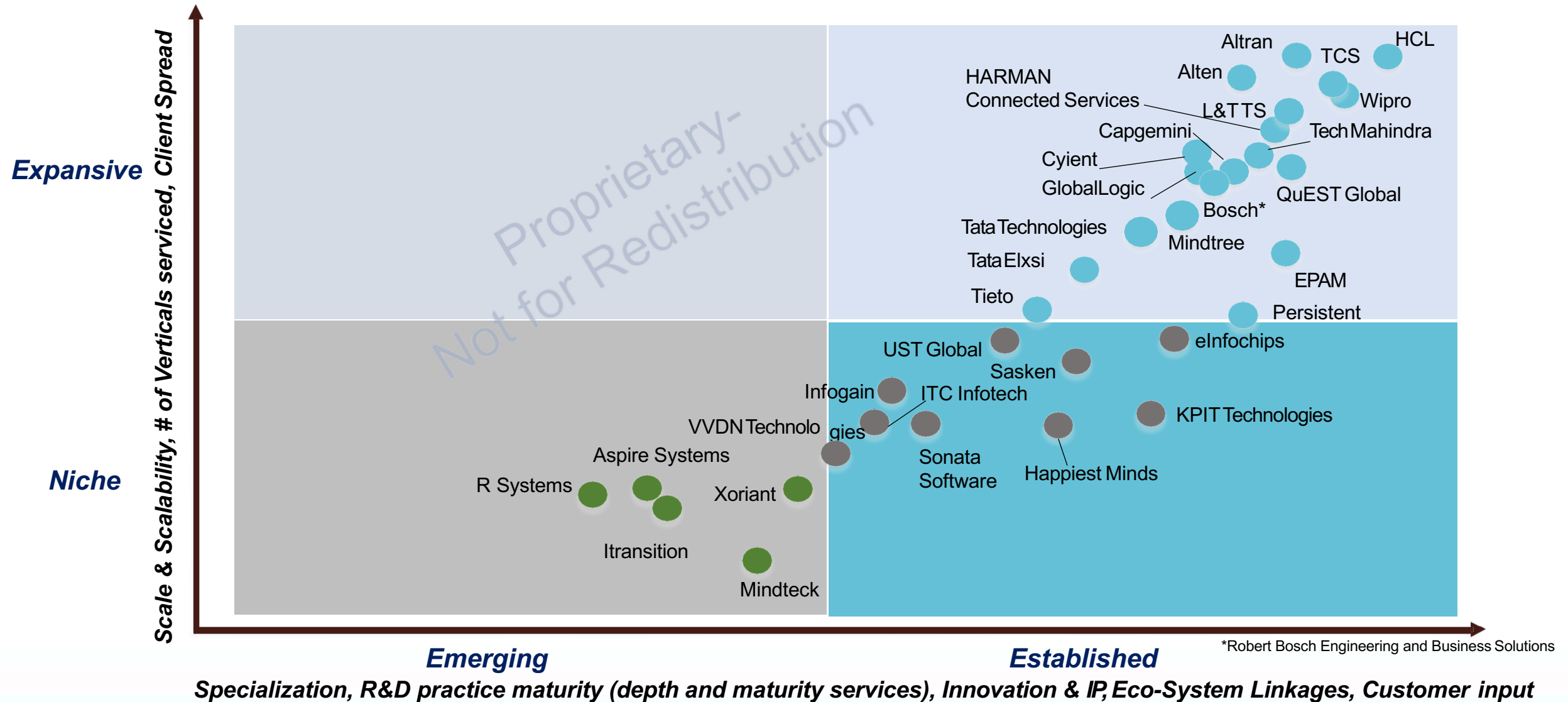
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Zinnov Zones ER&D Service provider Ratings 2018

- **Overall ER&D Ratings**
- Horizontal Ratings
 - v Design & Simulation engineering
 - v AI and ML engineering
 - v User experience engineering
 - v Platform engineering
 - v Quality Assurance engineering
- Vertical specific Ratings
 - v Aerospace
 - v Automotive
 - v Computer Peripherals and Storage
 - v Construction & Heavy Machinery
 - v Consumer Electronics
 - v Consumer Software v
 - Enterprise Software v
 - Energy & Utilities
 - v Industrial Automation
 - v Medical devices
 - v Semiconductor
 - v Telecommunication
 - v Transport





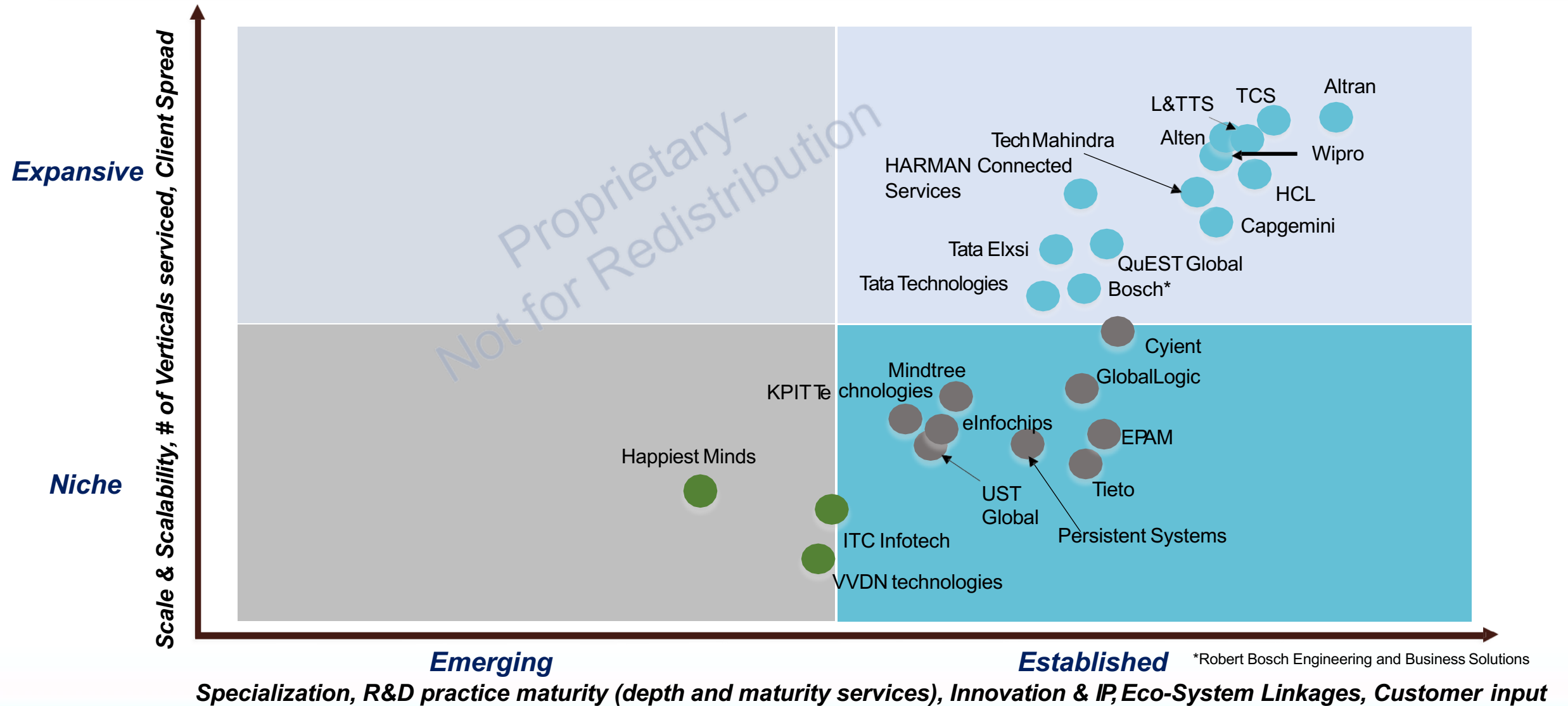
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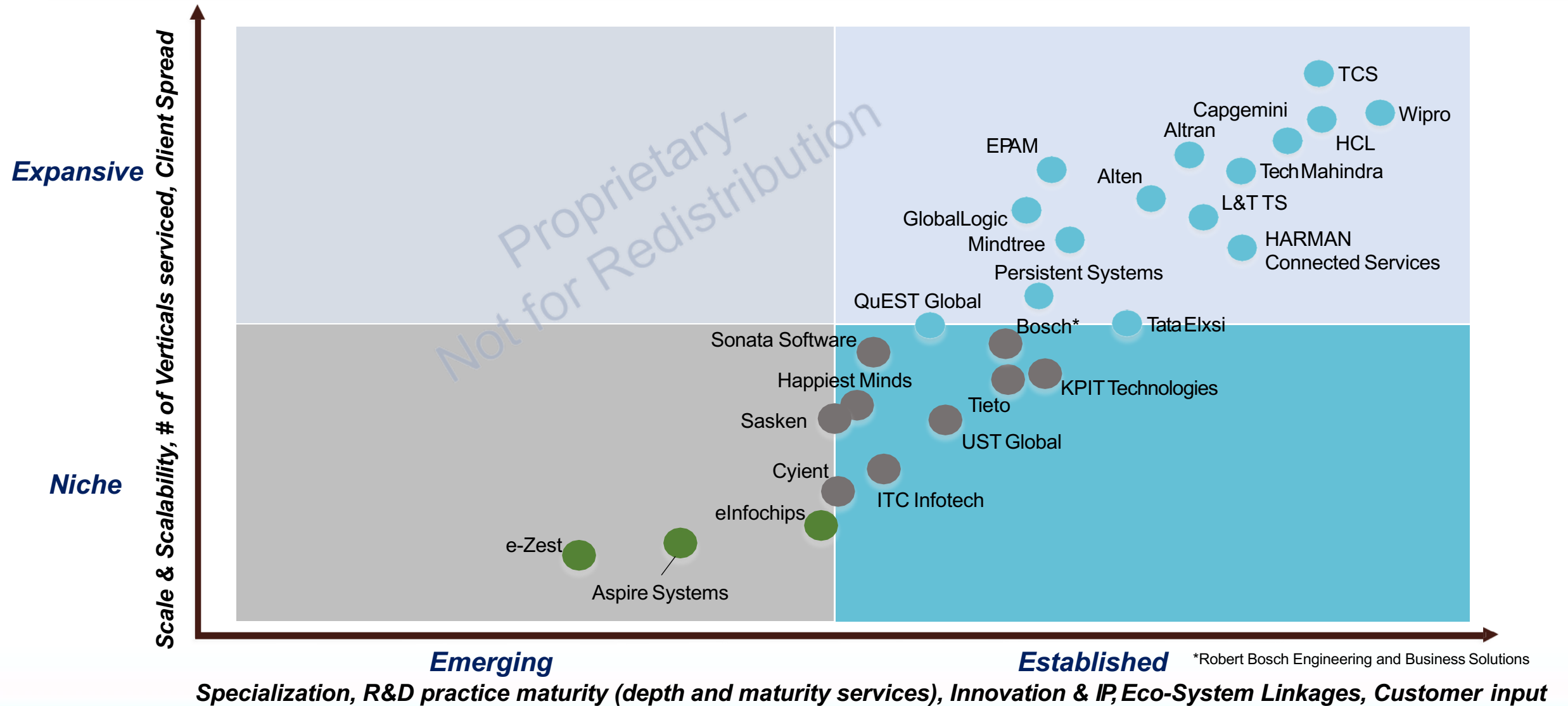
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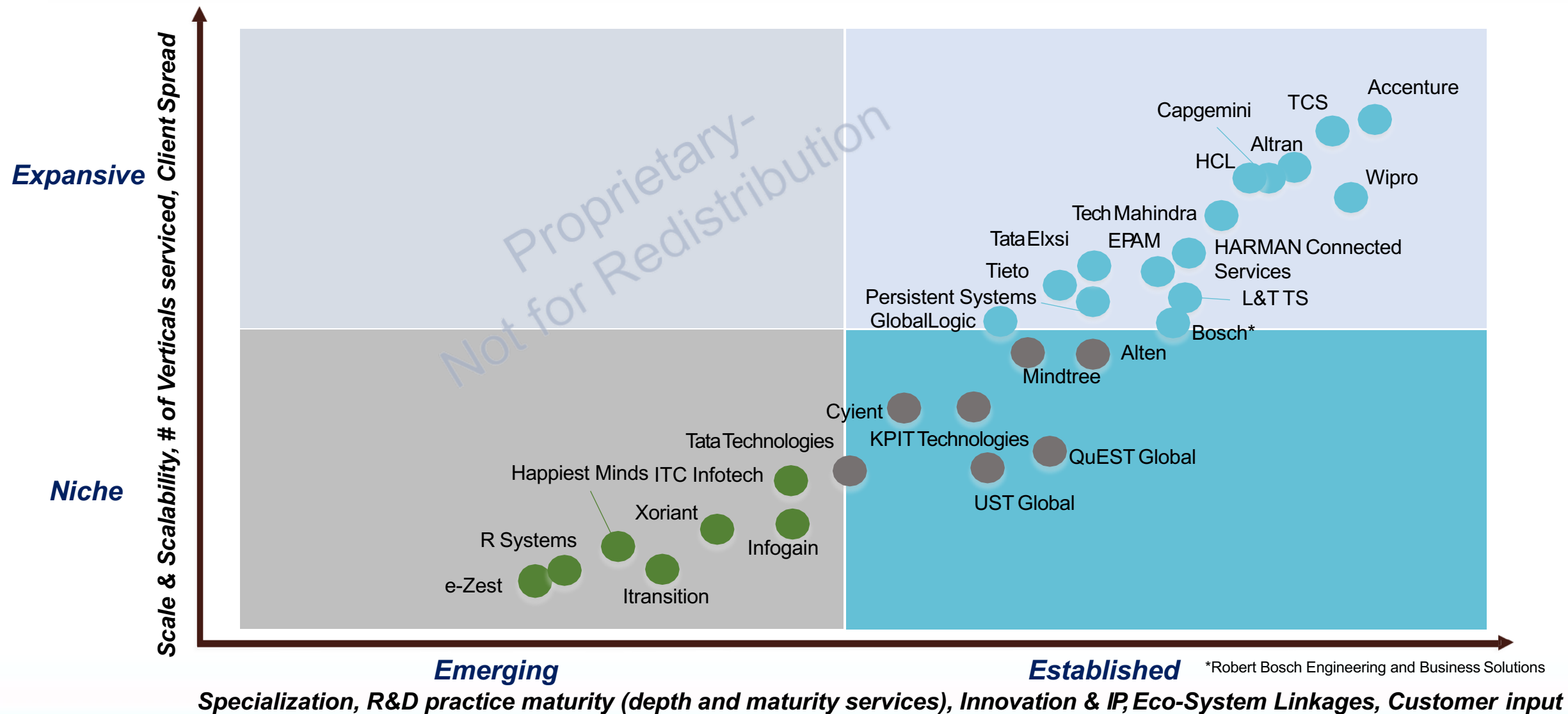
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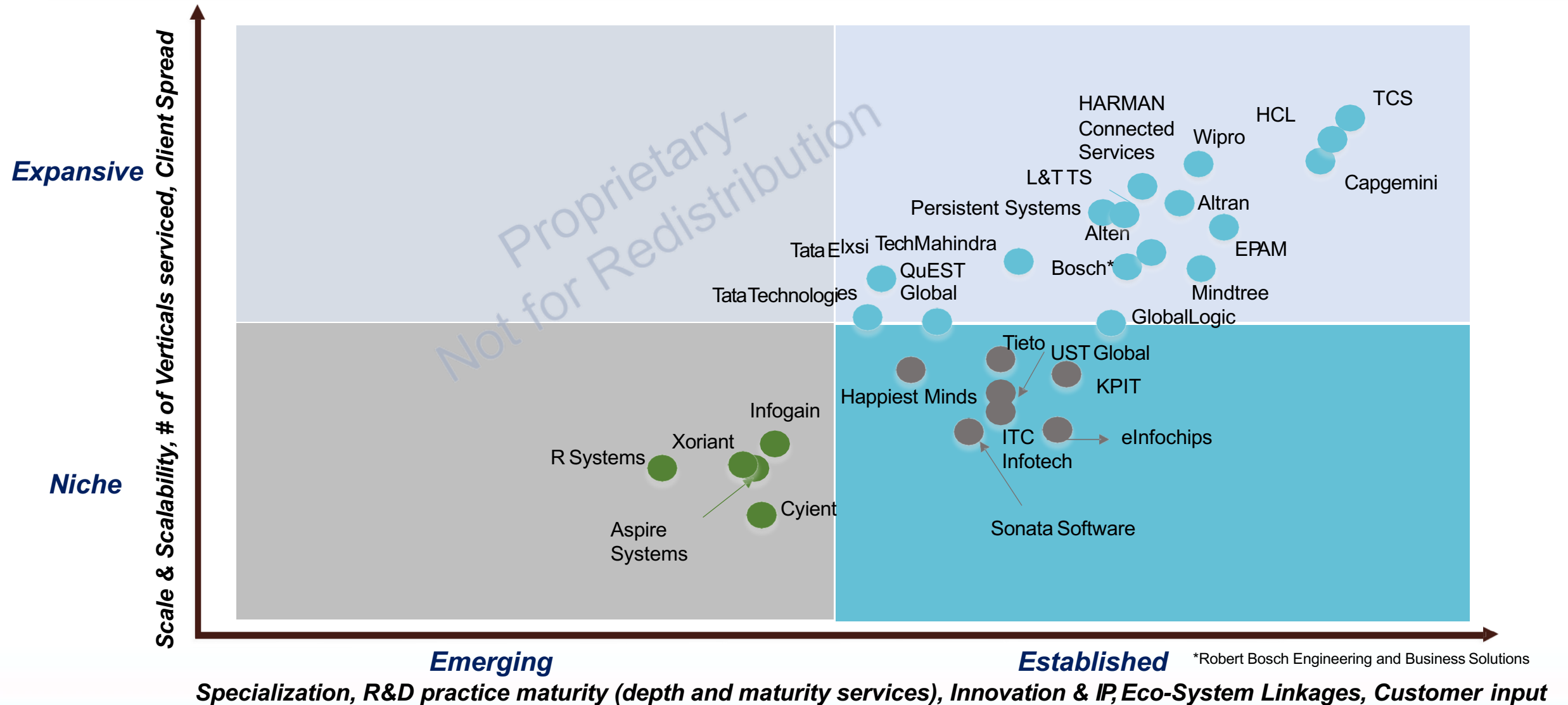
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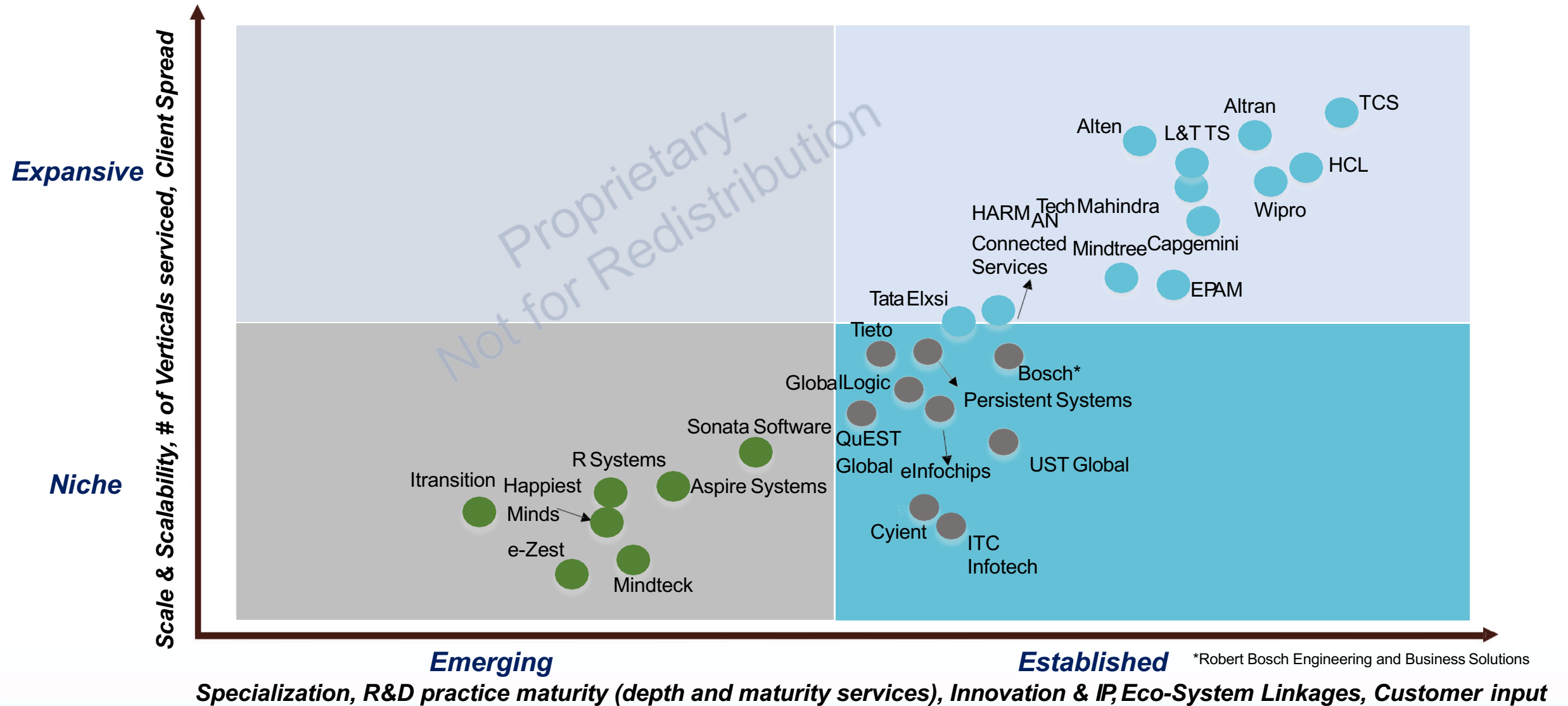
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01

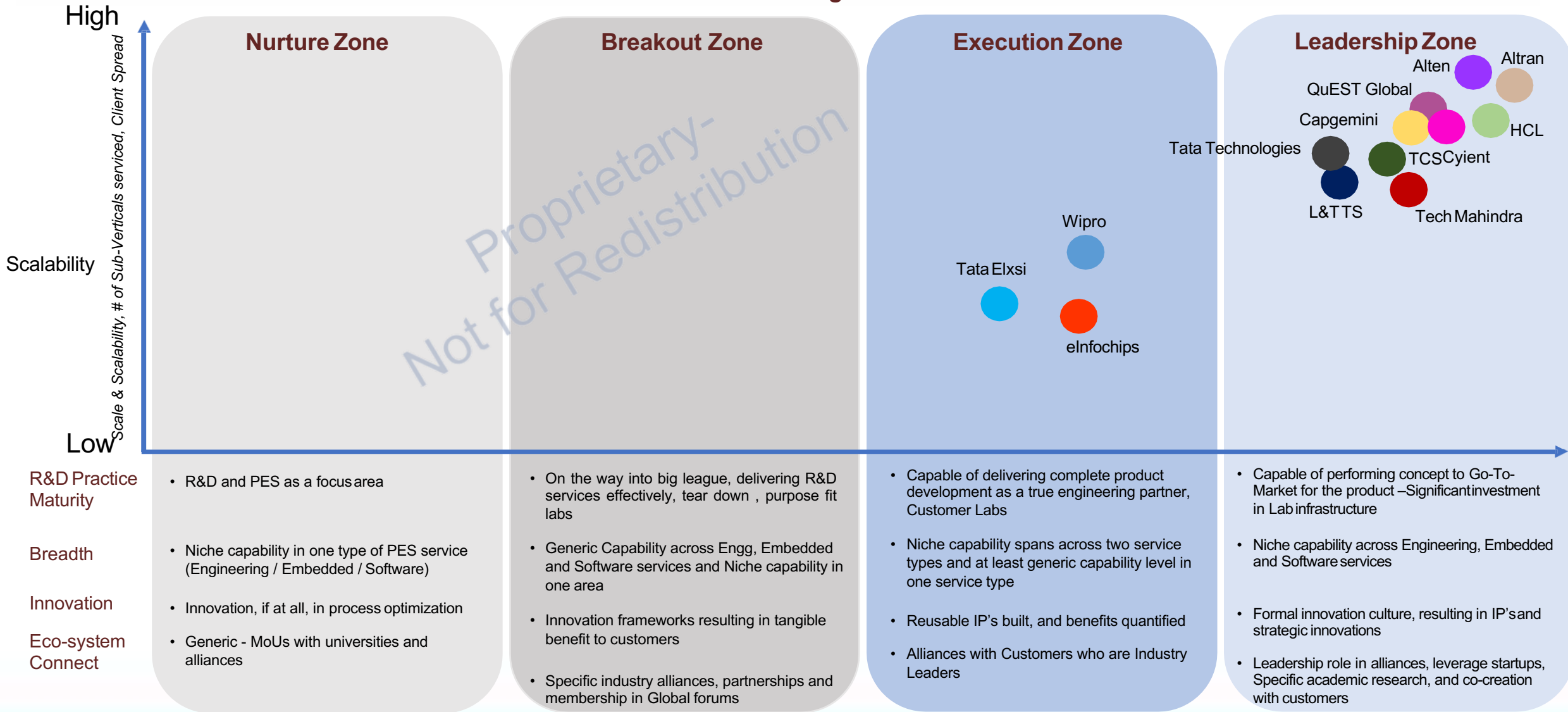
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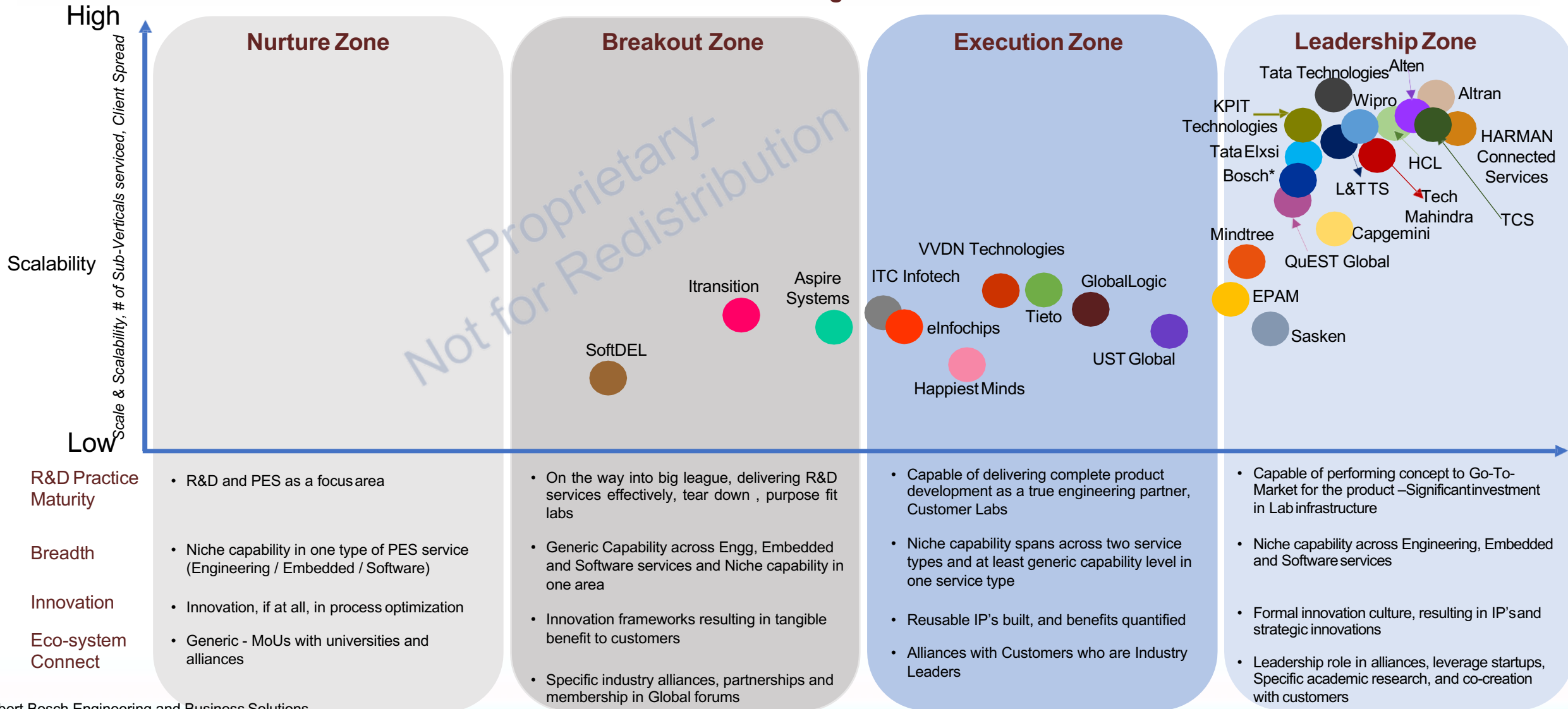
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 - v **Enterprise Software** v
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 - v **Semiconductor**
 - v **Telecommunication**
 - v **Transport**

Zinnov Zones – Leading Service Providers

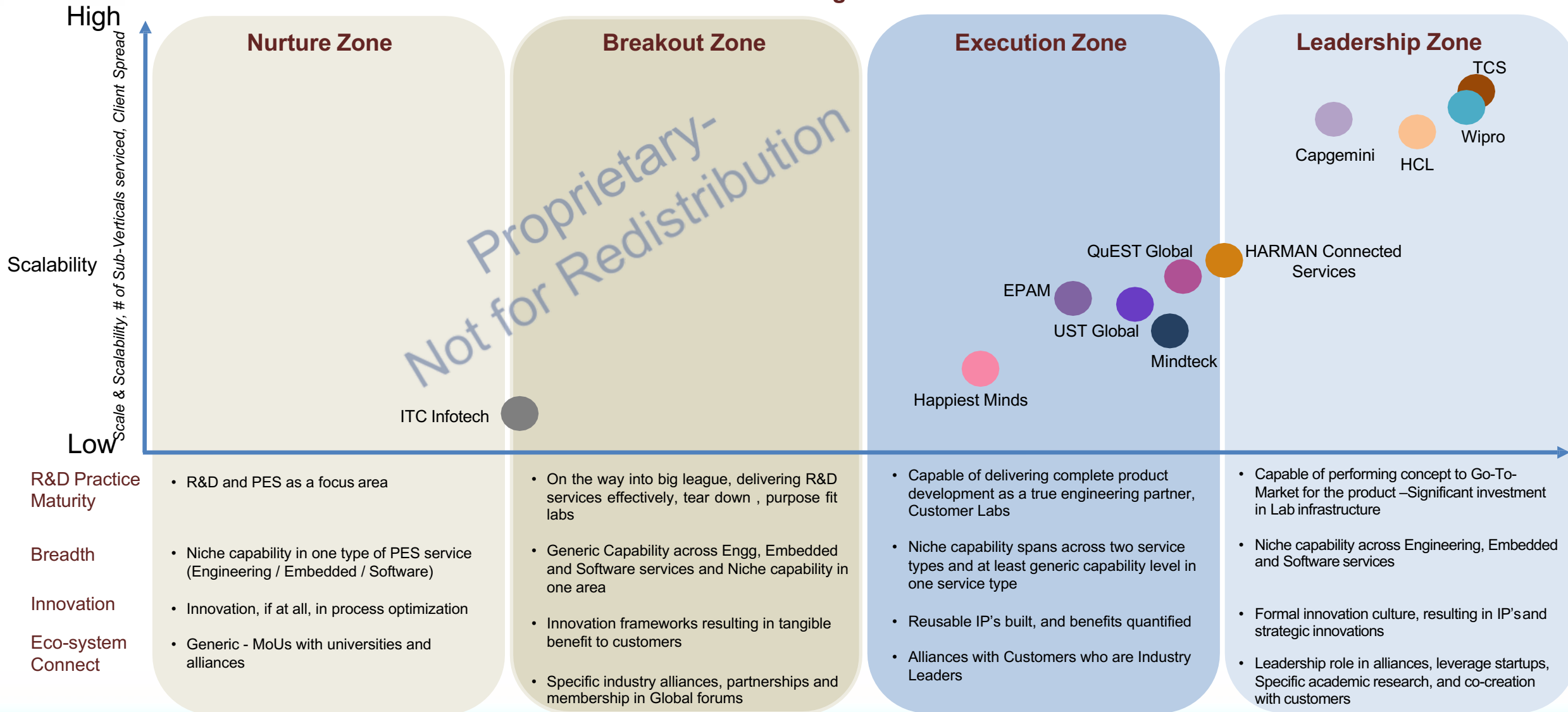


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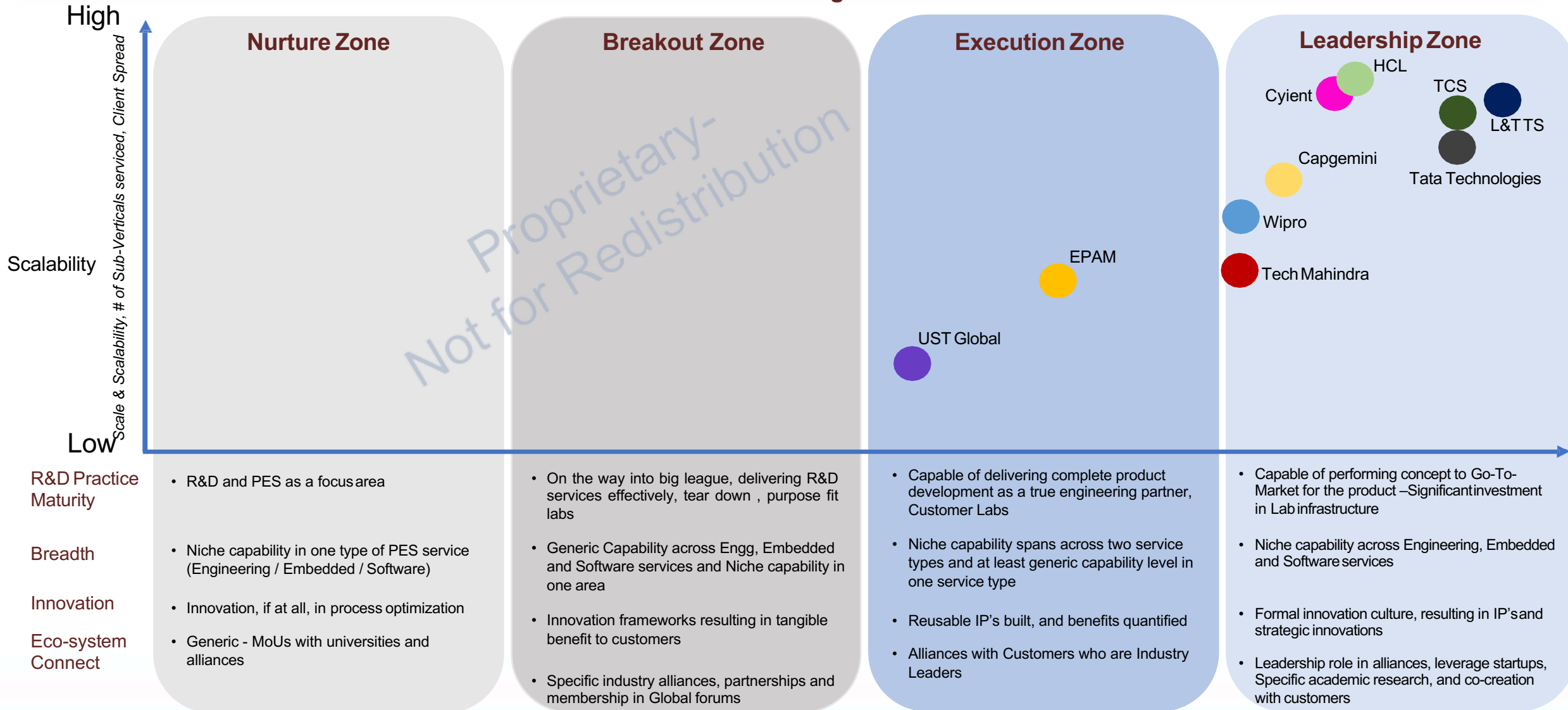


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Zinnov Zones – Leading Service Providers

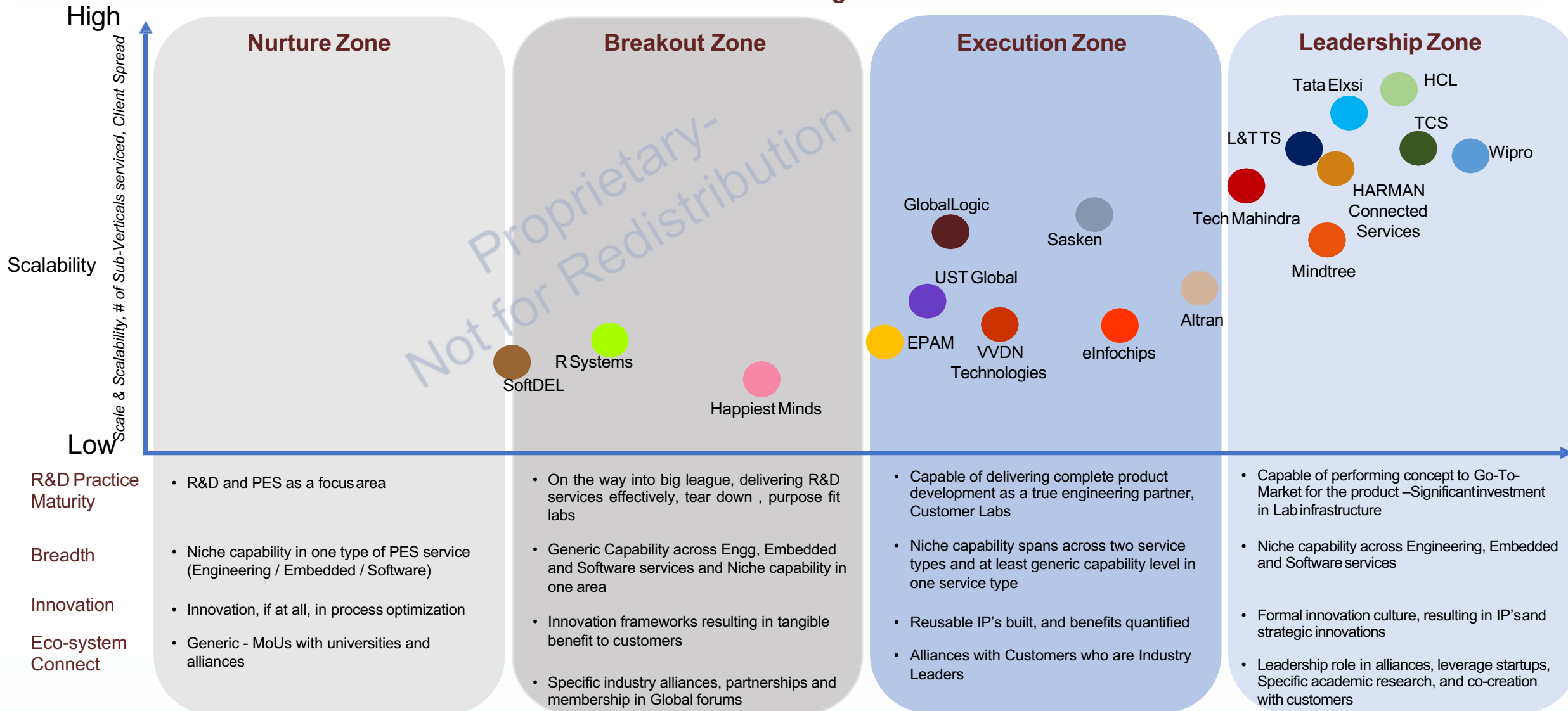


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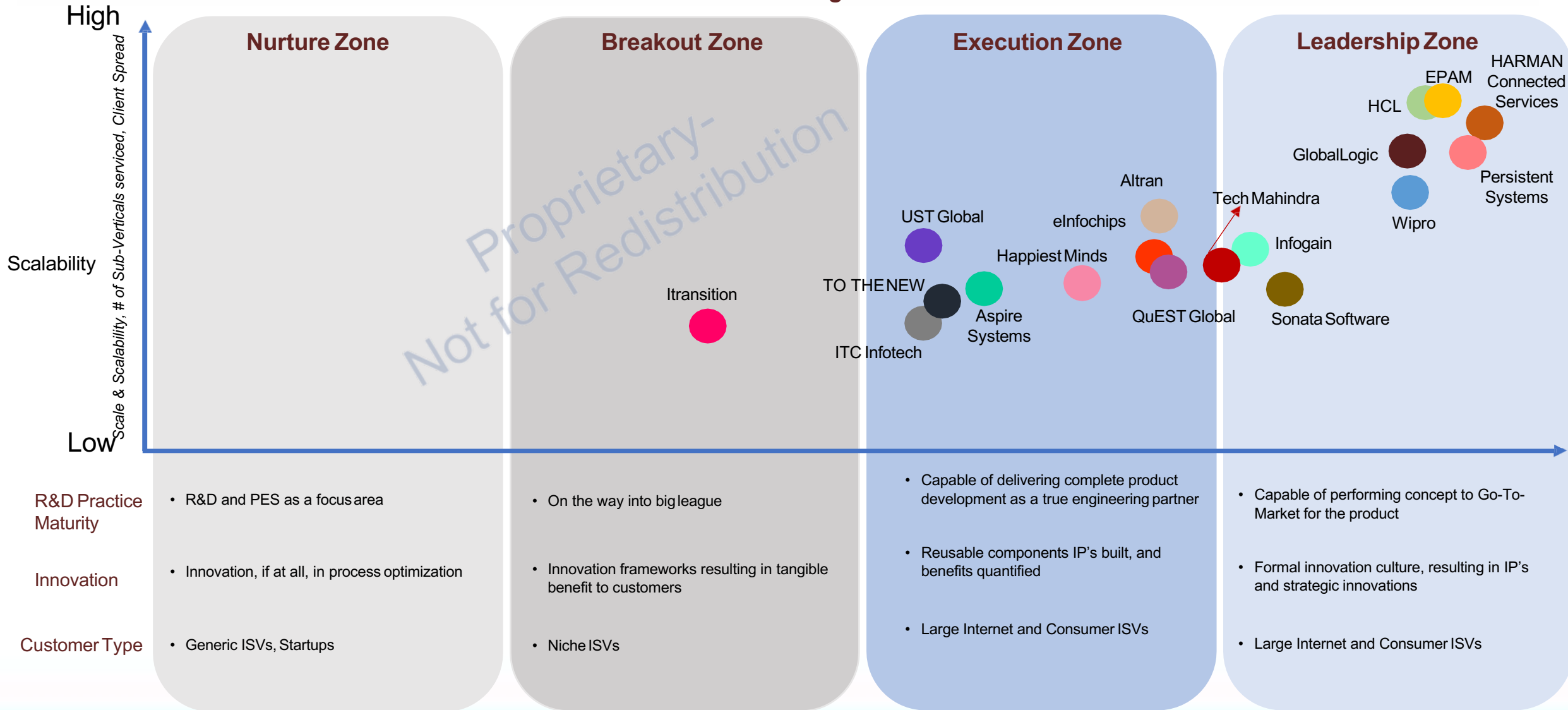
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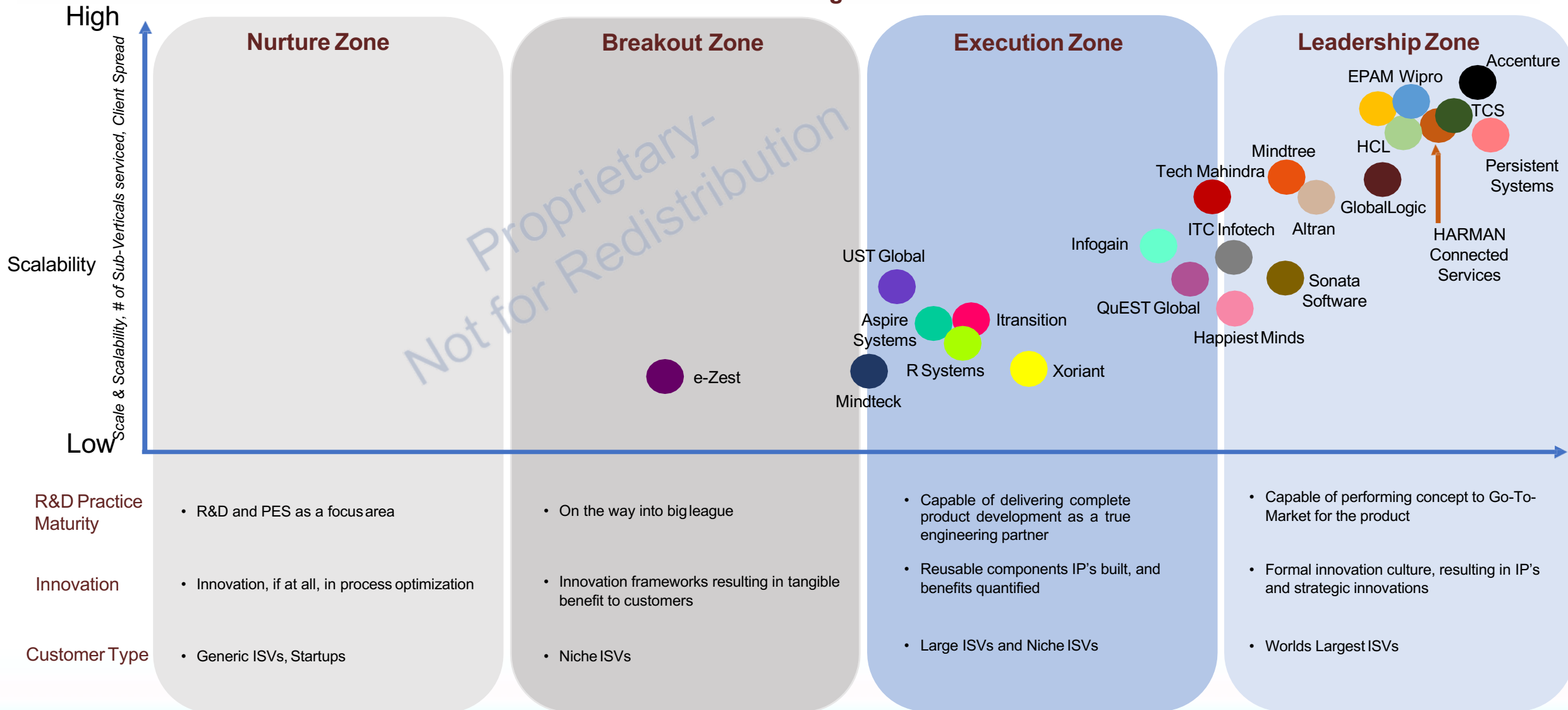


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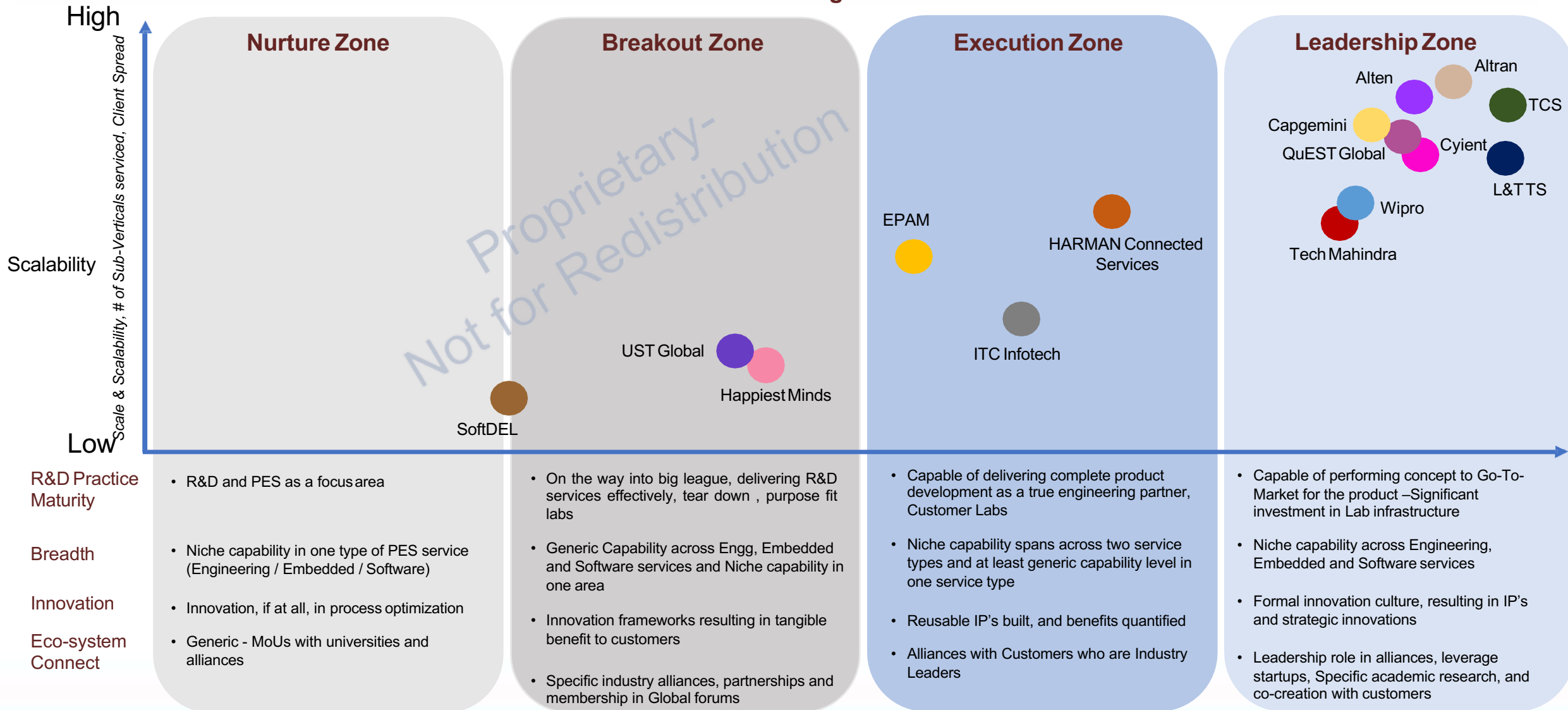


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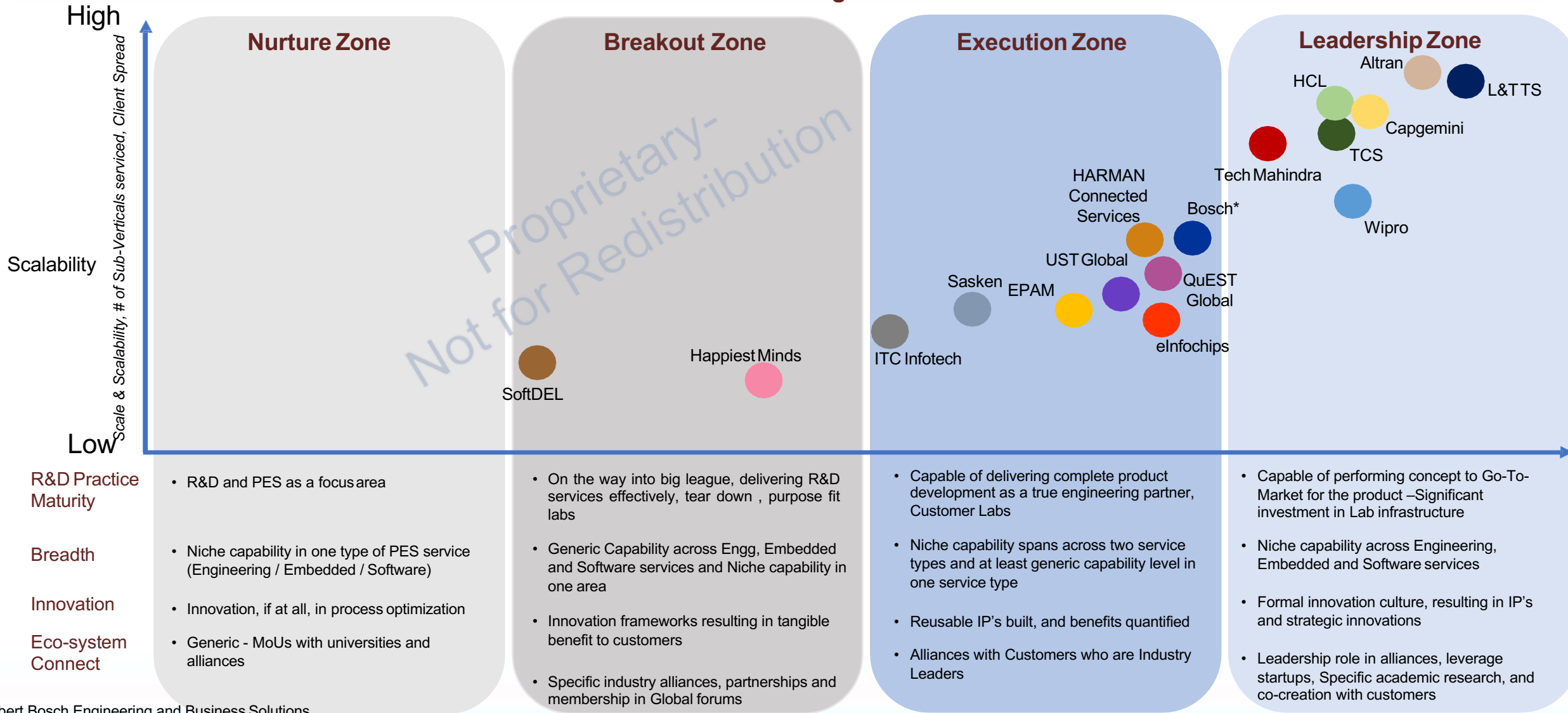
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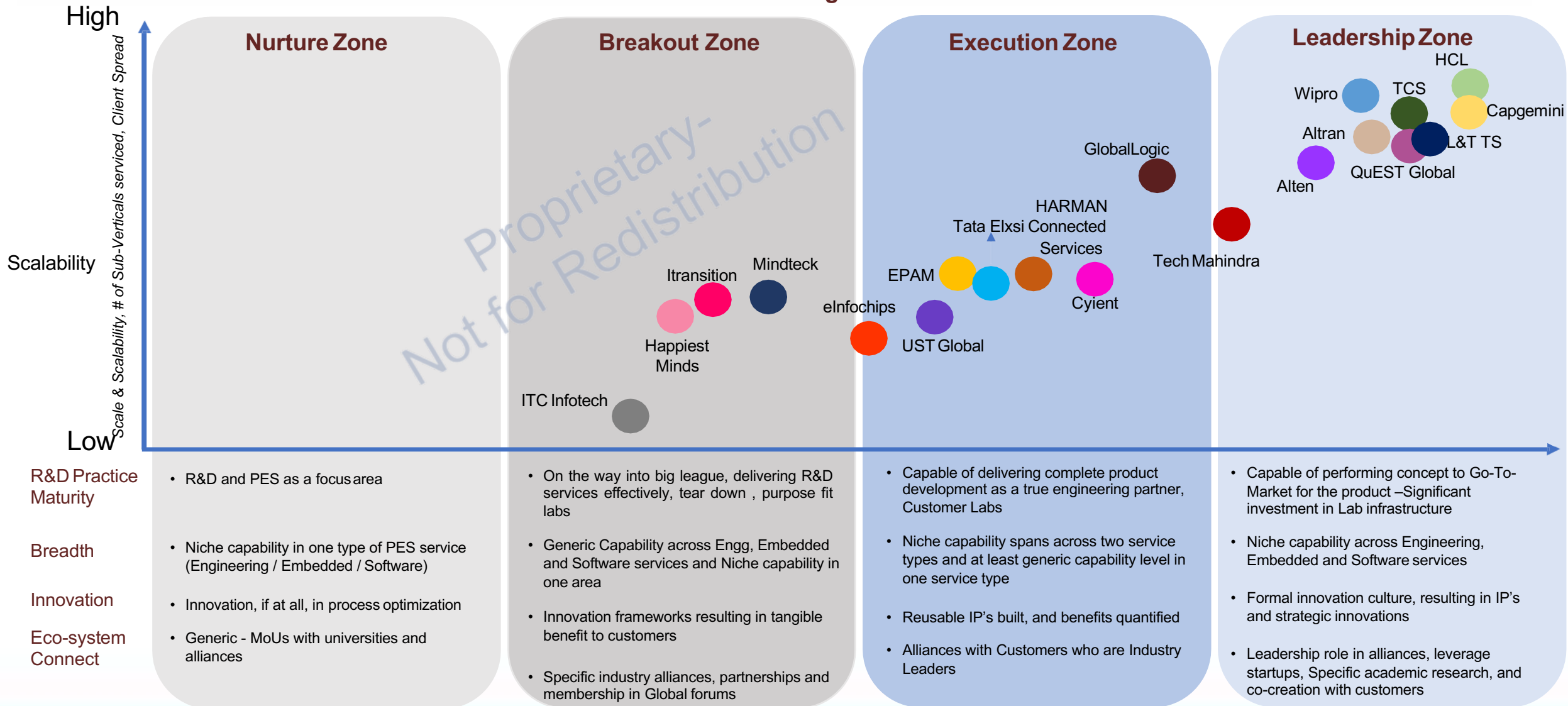
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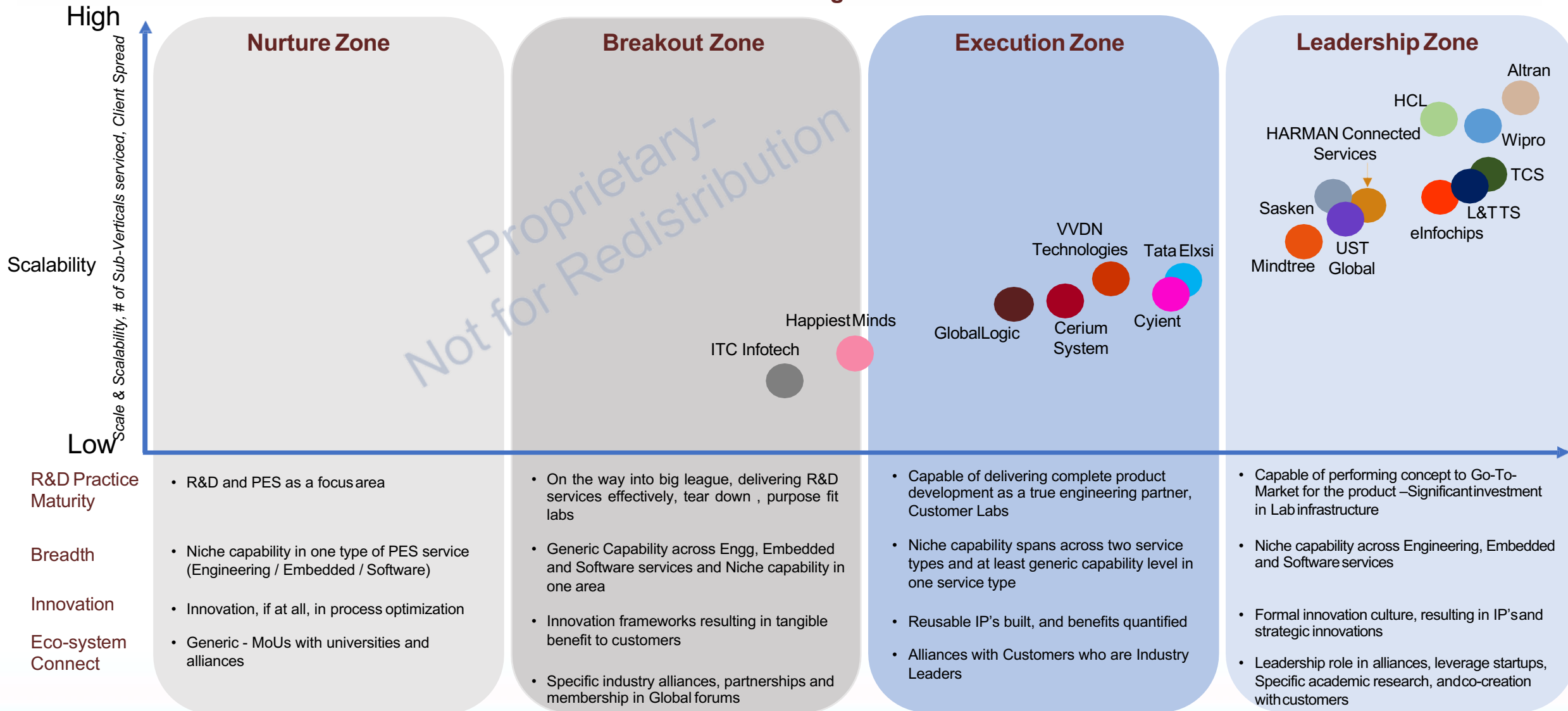
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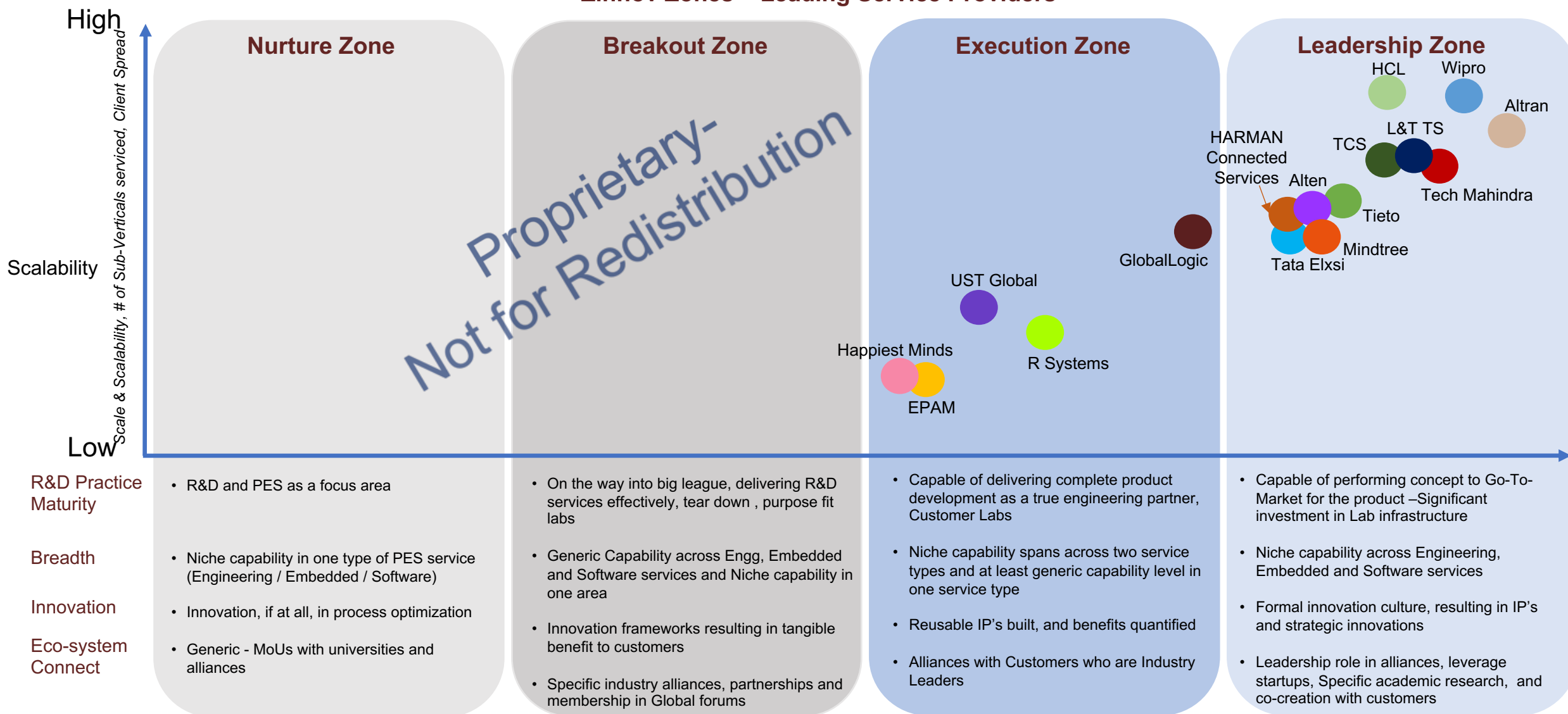


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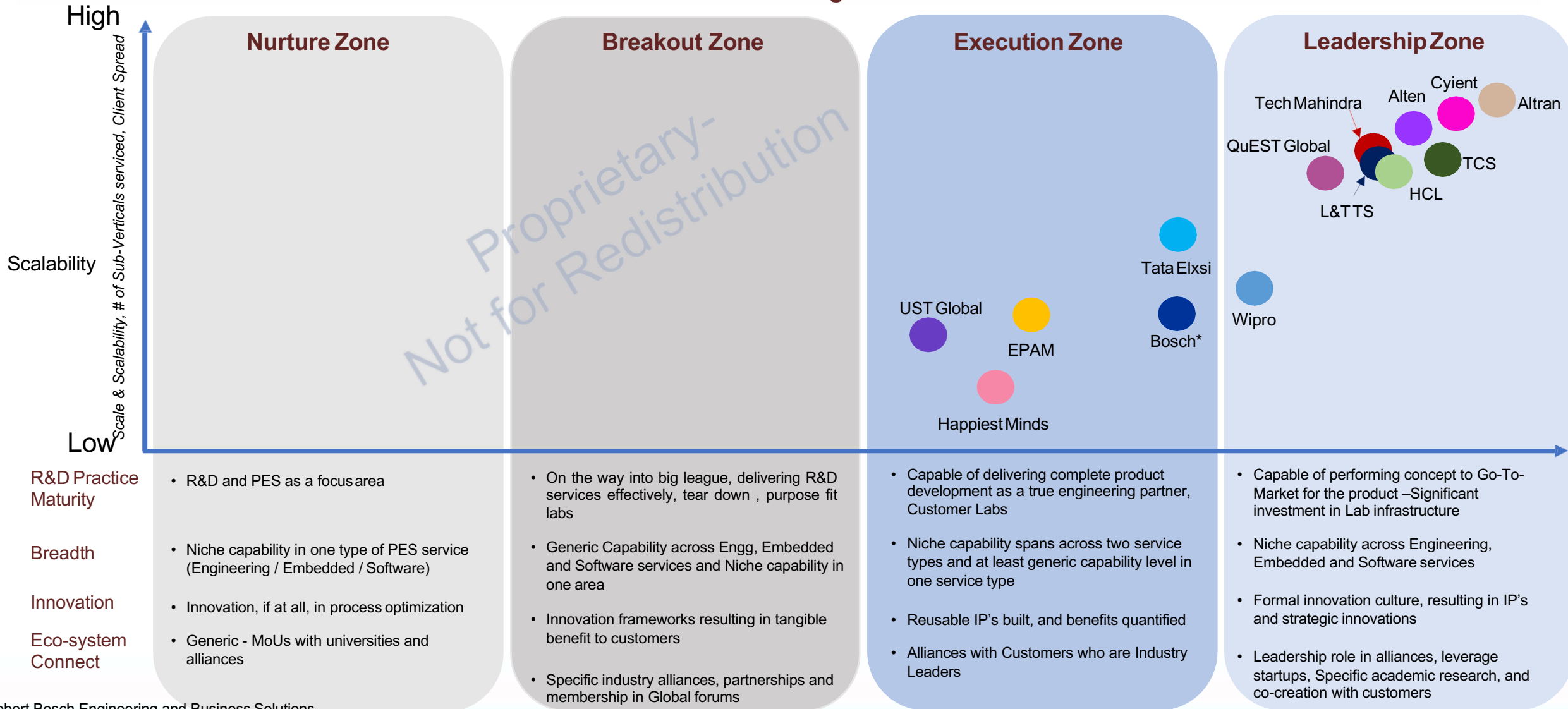
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