

Arthur D Little



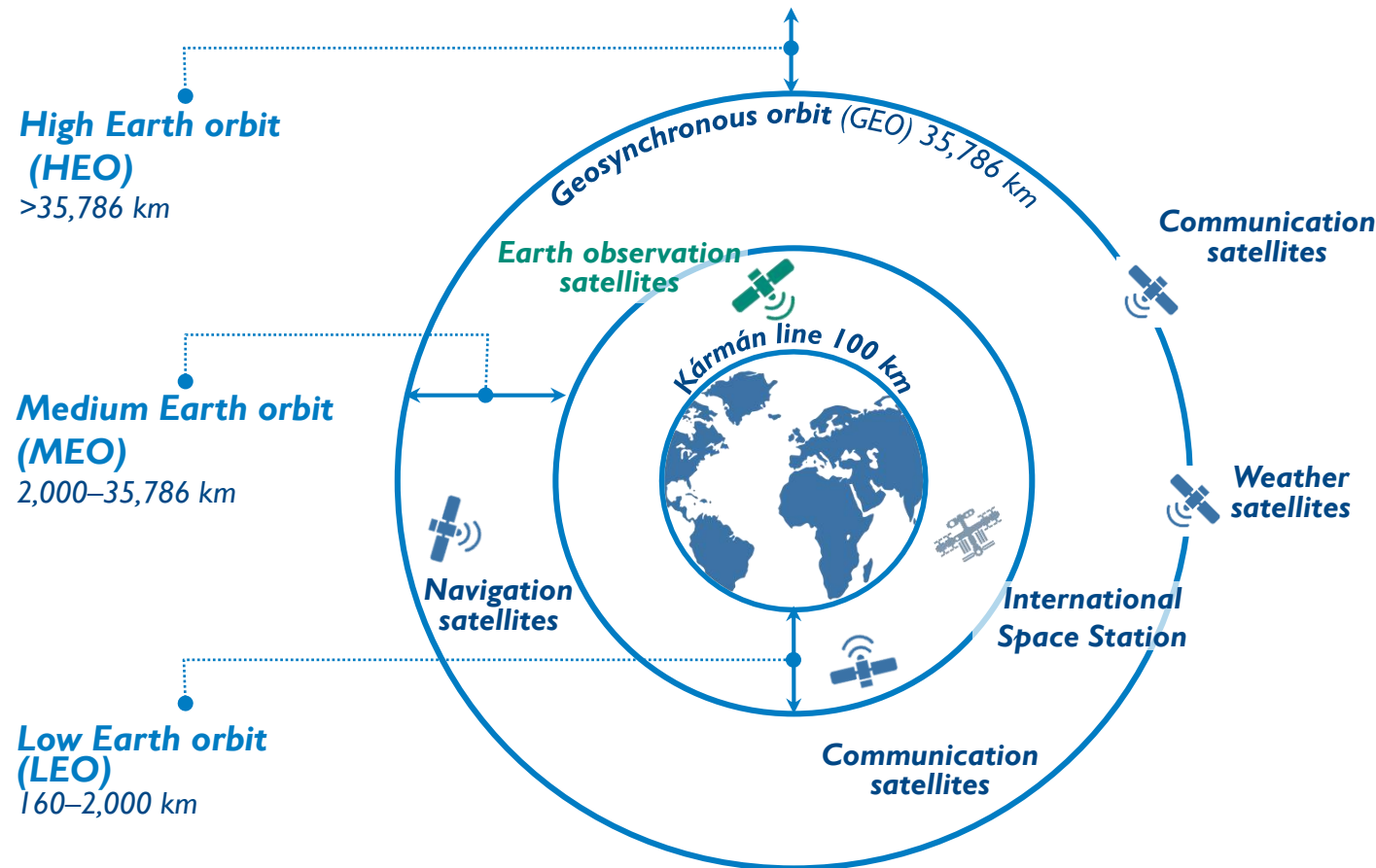
A sky full of eyes – Exploring the commercial opportunity in Earth observation

Media series

November 2018

A sky full of eyes – Exploring the commercial opportunity in Earth observation

600+ Earth observation satellites are constantly keeping an eye on us from space – is there a commercial opportunity in Earth watching, and how can companies play in this space?



Key insight

600+ Earth observation satellites are orbiting our planet, collecting data and images, as well as monitoring and tracking changes

In eight executive briefing series, Arthur D. Little shares key insight into the commercial opportunity in Earth observation and how companies can play and win in this space. We look into:

- What is Earth observation, and what are its key applications?
- What is driving the interest in Earth observation, and is there a commercial opportunity?
- Where is the sector headed?
- How to ride the Earth observation wave and win?

Next edition:
Earth observation applications

Your contacts:

Jaap Kalkman, Partner
Kalkman.Jaap@adlittle.com



Adnan Merhaba, Principal
Merhaba.Adnan@adlittle.com



Matteo Ainardi, Principal
Ainardi.Matteo@adlittle.com



A sky full of eyes – Exploring the commercial opportunity in Earth observation

Analytical solutions based on Earth imagery are used across a wide range of industries, promising high impact and disruptive changes



Earth observation applications

Agriculture

Monitoring crop health, estimating yield, optimizing production and costs

Rezatec, telluslabs, urthecast, Descartes Labs

Disaster risk reduction

Predicting and monitoring of disasters to support rescue & relief operations

Orbital Insight, planet., earth.i, EAGLEVIEW, AIRBUS DEFENCE & SPACE

SELECTED EXAMPLES

Insurance

Monitoring assets, assessing risk and detecting changes to streamline insurance processes

CAPE ANALYTICS, earth.i, planet., spire

Commercial

Assessing market dynamics, increasing visibility over supply chains, analyzing economic activity, etc.

Orbital Insight, SPACE_KNOW, planet., earth.i, RS Metrics

Infrastructure

Monitoring deployed assets, planning new installations, predicting infrastructure failure

SPACE_KNOW, bird.i, AIRBUS DEFENCE & SPACE, planet., Ursa

Defense

National security and defense monitoring (e.g., tracking maritime and airfield activity)

EAGLEVIEW, earth.i, AIRBUS DEFENCE & SPACE, planet., MAXAR

Key insight

- Companies are building analytical services based on Earth observation imagery, with different applications across industries
- Defense and government applications are still a key source of demand; however, use cases in other industries (insurance, commercial, etc.) are gaining traction
- Early adopters tend to be from technology-exposed industries
- Customers are increasingly demanding solution-based services (e.g., intelligence, supporting decision-making) rather than pure image-based products

Next edition:
Market value & key drivers

Your contacts:

Jaap Kalkman, Partner
Kalkman.Jaap@adlittle.com



Adnan Merhaba, Principal
Merhaba.Adnan@adlittle.com



Matteo Ainardi, Principal
Ainardi.Matteo@adlittle.com



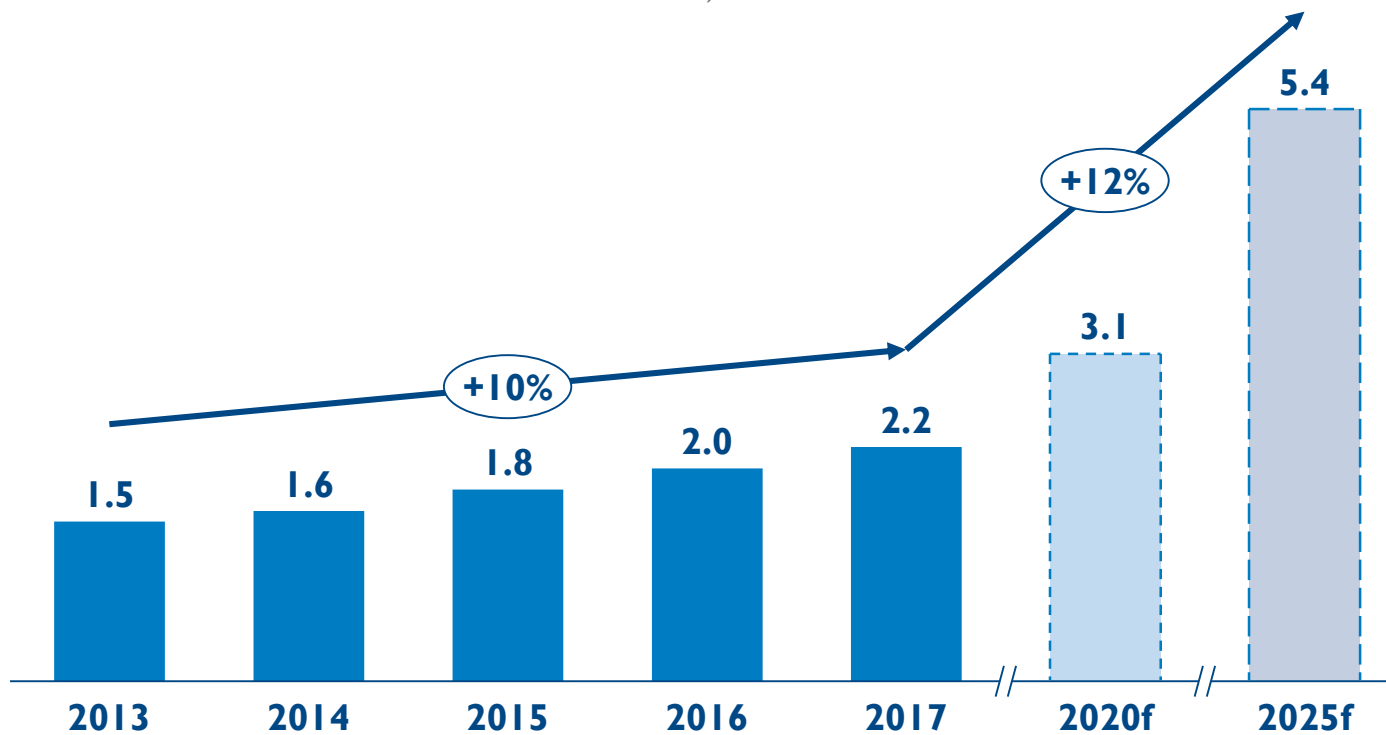
A sky full of eyes – Exploring the commercial opportunity in Earth observation

Cheaper access to space and advances in data analytics will continue driving the double-digit growth of the Earth observation sector



Global Earth observation data and services revenue

2013–2025, USD billion



Source: Arthur D. Little based on Euroconsult

Key insight

- The Earth observation sector is expected to continue its double-digit growth, driven by:
 - Availability of cheaper SmallSat technologies and decreasing costs of launching and operating satellites, which are making commercial solutions more viable
 - Advances in data analytics and artificial intelligence that make Earth observation solutions more accessible and enable the emergence of new applications across industries

Next edition: Investment dynamics

Your contacts:

Jaap Kalkman, Partner
Kalkman.Jaap@adlittle.com



Adnan Merhaba, Principal
Merhaba.Adnan@adlittle.com



Matteo Ainardi, Principal
Ainardi.Matteo@adlittle.com



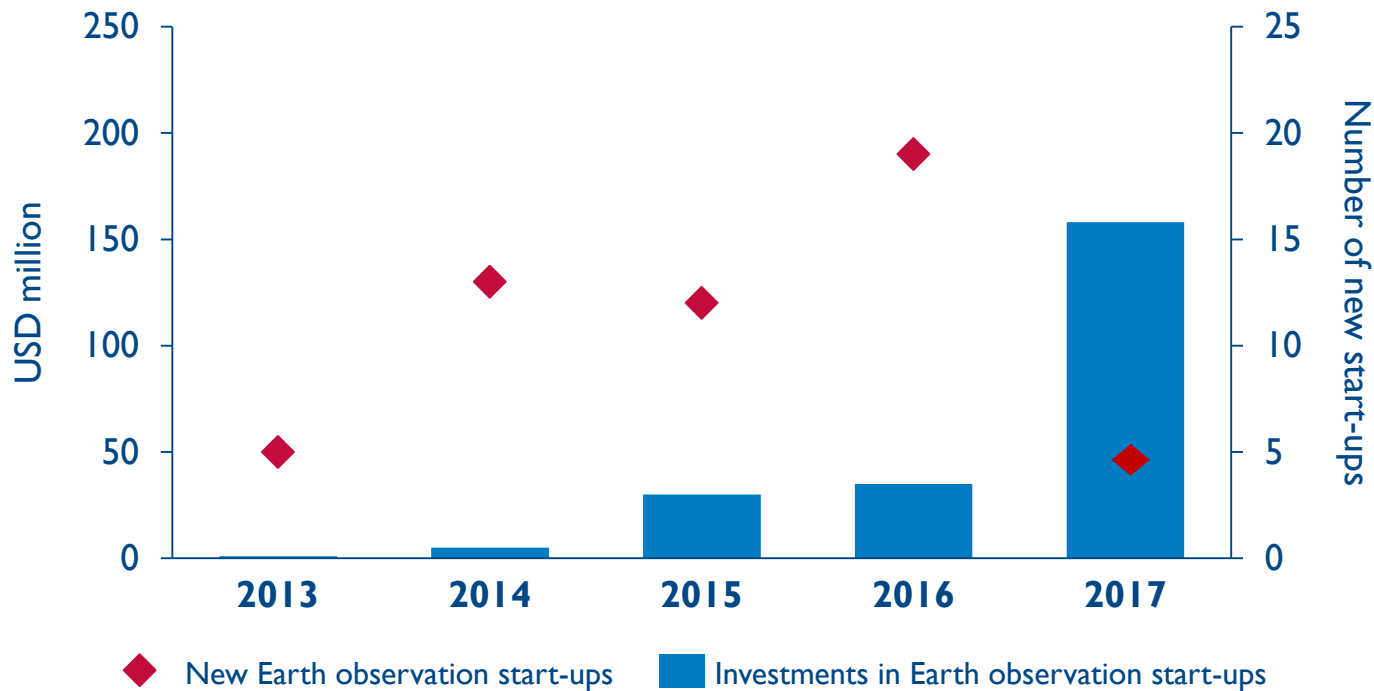
A sky full of eyes – Exploring the commercial opportunity in Earth observation

Investor interest in Earth observation start-ups has significantly increased, driven by the expansion of potential use cases and range of clients



Start-up investment dynamics in Earth observation

2013–2017



Source: Arthur D. Little based on Norther Sky Research

Key insight

- Investor interest in Earth observation has significantly increased over the past 5 years:
 - Over USD 220 million was invested and over 50 new start-ups were set up
 - 2017 was a boom year, with a ~9x increase in invested capital compared to the average of the previous 4 years
- Investor interest is driven by expansion of use cases/ applications and potential customers (e.g., going beyond government-backed demand)
- New start-up companies are focusing on data analytics

Next edition:
M&A trends

Your contacts:

Jaap Kalkman, Partner
Kalkman.Jaap@adlittle.com



Adnan Merhaba, Principal
Merhaba.Adnan@adlittle.com



Matteo Ainardi, Principal
Ainardi.Matteo@adlittle.com



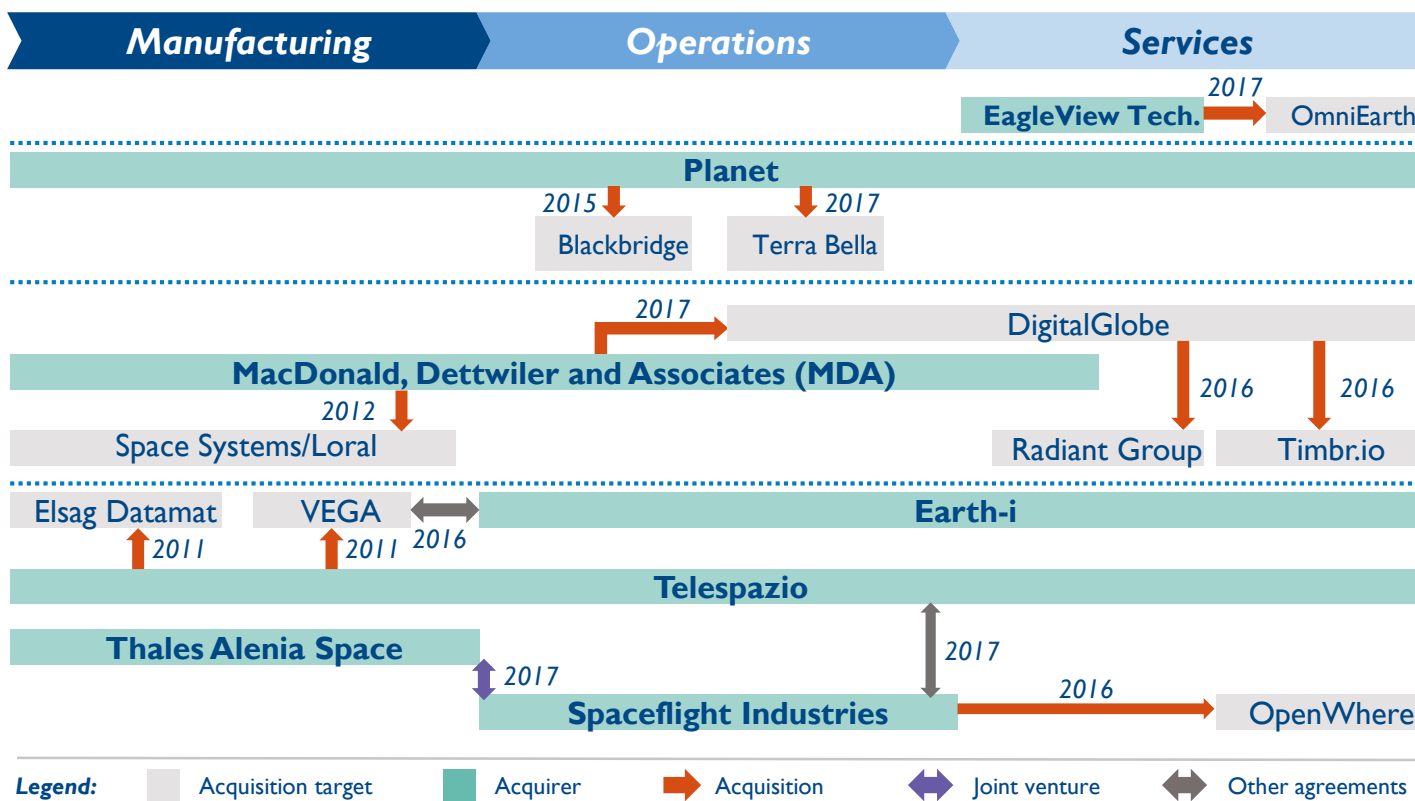
A sky full of eyes – Exploring the commercial opportunity in Earth observation

Existing players are furthering their stake in the sector and extending capabilities from pure satellite operation and image sales to analytics services based on Earth imagery



M&A dynamics in the Earth observation sector

SELECTED EXAMPLES



Key insight

- The Earth observation sector is evolving, with key players extending their capabilities:
 - Recent vertical integration deals allow for building a full set of upstream and downstream capabilities (Spaceflight Industries, OpenWhere, etc.)
 - Horizontal mergers (e.g., Planet, Terra Bella & Blackbridge) allow for scale and tapping into adjacent segments
- Value generation is moving from pure image sales towards ability to sell analytical solutions on top of Earth imagery

Next edition:
Key business models

Your contacts:

Jaap Kalkman, Partner
Kalkman.Jaap@adlittle.com



Adnan Merhaba, Principal
Merhaba.Adnan@adlittle.com



Matteo Ainardi, Principal
Ainardi.Matteo@adlittle.com



A sky full of eyes – Exploring the commercial opportunity in Earth observation

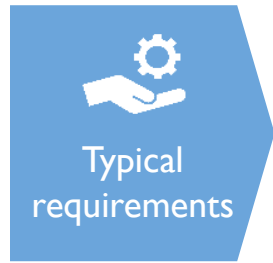
Successful Earth observation businesses typically adopt one of 2 main business models – captive, government-backed demand or industry-focused model



Government-backed model

Industry-focused model

Key insight



- Providers serving **demand mainly from defense and intelligence government** entities or other government authorities, etc.

- Providers focusing on the commercial sector, offering **niche industry vertical solutions and targeting** specific sectors

- Business models in Earth observation focus on government- or commercially backed demand, with distinct differences in buying and usage patterns for each

- **High-resolution** images to support defense & intelligence applications
- **Focus on data sales** due to national security considerations and reluctance to outsource analytics
- **Long purchasing cycles**

- **Lower-resolution**, high-revisit images to support quick commercial insight
- **Focus on actionable analytics** to solve business problems and support decision-making
- **Industry-specific** applications

- Governments typically release long-term contracts and are interested in **image acquisition**, while taking data analytics in-house for confidentiality reasons
- Commercial actors are focused on **analytical solutions** and willing to purchase them, given intrinsic value for their businesses is unlocked



▶ **Next edition:**
Market positioning

Your contacts:

Jaap Kalkman, Partner
Kalkman.Jaap@adlittle.com



Adnan Merhaba, Principal
Merhaba.Adnan@adlittle.com



Matteo Ainardi, Principal
Ainardi.Matteo@adlittle.com



A sky full of eyes – Exploring the commercial opportunity in Earth observation



To capture the commercial opportunity in Earth observation, prospective players have three main options – choosing the right positioning depends on market specificities and internal aspects

 **Satellite operator**

 **VAS player**

 **Integrated player**

Operating an Earth observation satellite constellation, offering data to resellers or final customers

Sourcing data from Earth observation satellite operators and **offering VAS analytics solutions**

Integrating **Earth observation satellite operations** with **VAS service offerings**



- Opportunity to **differentiate** through a **unique data set/ images**

- **Increased customer interest in analytics solutions**
- **Capex-light model**
- Availability of **open access data sets** (Sentinel, Landsat)

- **Control over data supply, quality and cost** of image acquisition
- Opportunity to **differentiate** through a **unique data set/ images**



- **Capital intensive**
- **Increasing number of Earth observation constellations**
- **Availability of open-access data and increasing data commoditization**

- **No control** over image supply and quality
- **Issues with data quality, synchronization and platform interoperability**

- **Most capex intensive**, with uncertain returns
- **Availability of open-access data and increasing data commoditization**

Key insight

- The decision on type of market positioning needs to take into account internal and external factors:
 - From an external perspective – market demand, range of use cases and technology developments are key
 - From an internal perspective – capabilities, financial commitment and risk tolerance need to be taken into account
- Uncertainty exists regarding the sustainability of pure data play/satellite operations due to a shift towards open data and data commoditization

Next edition:
Key success factors

Your contacts:

Jaap Kalkman, Partner
Kalkman.Jaap@adlittle.com



Adnan Merhaba, Principal
Merhaba.Adnan@adlittle.com



Matteo Ainardi, Principal
Ainardi.Matteo@adlittle.com



A sky full of eyes – Exploring the commercial opportunity in Earth observation

To be successful in Earth observation, players need to combine a solution-based mind-set, advanced technical capabilities and strong market push



Earth observations play – key success factors



Raise market awareness

Raising **awareness** of Earth observation **applications**, as well as finding **new use cases** targeted at solving **industry-specific problems**, will be key in developing the market



Adopt a solution-based, rather than a product-based mind-set

Focus on **developing solutions** together with clients, ensuring strong **understanding of end-user needs** and requirements rather than pushing a standard product set



Leverage what you know

Leverage **knowledge** of a **specific vertical** and understanding of local economic specificities to identify potential pockets of opportunities and design **tailored client solutions**



Build up technical capabilities

Build **capabilities** for **imagery analytics**, data **processing & management**, utilizing machine learning/artificial intelligence, and establish an easy-to navigate, **user-friendly interface**



Distill insight leveraging a range of data sources

Distill insight **combining satellite Earth observation data with other data sources**, which will create a **unique data pool** and **analytical depth**

Key insight

- Combining technical capabilities and commercial acumen is key to winning in the Earth observation market
 - Key technical skills include imagery analytics, data processing & data management based on advanced technologies (e.g., machine learning/artificial intelligence)
 - Commercial capabilities revolve around deep vertical knowledge, ability to proactively develop demand and explore new use cases, and adopting a solution-based mind-set

▶ Feel free to contact us for further insight

Your contacts:

Jaap Kalkman, Partner
Kalkman.Jaap@adlittle.com



Adnan Merhaba, Principal
Merhaba.Adnan@adlittle.com



Matteo Ainardi, Principal
Ainardi.Matteo@adlittle.com



Arthur D Little

Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organizations.

Our consultants have strong practical industry experience combined with excellent knowledge of key trends and dynamics. ADL is present in the most important business centers around the world. We are proud to serve most of the Fortune 1000 companies, in addition to other leading firms and public sector organizations.

For further information please visit www.adlittle.com or www.adl.com.

Copyright © Arthur D. Little Luxembourg S.A. 2018.
All rights reserved.

Jaap Kalkman

Managing Partner

M: +971 55 559 4332

E: Kalkman.Jaap@adlittle.com

Adnan Merhaba

Principal

M: +971 55 559 4325

E: Merhaba.Adnan@adlittle.com

Matteo Ainardi

Principal

M: +33 1 55 74 28 31

E: Ainardi.Matteo@adlittle.com

Arthur D. Little Middle East FZ-LLC
Office 606, 6th Floor
Arjaan Tower, Dubai Media City,
Dubai, UAE

Arthur D. Little France,
7 Place d'Iéna, 75116
Paris, France