## Technology


*Source: Refinitiv*

## Market data

| | |
|---|---|
| EPIC/TKR | **ASAI.SE** |
| Price (SEK) | **5.7** |
| 12m High (SEK) | 31.3 |
| 12m Low (SEK) | 4.2 |
| Shares (m) | 43.2 |
| Mkt Cap (SEKm) | 246.5 |
| EV (SEKm) | 378.5 |
| Free Float* | 30% |
| Market | Nasdaq First North |

**As defined by AIM Rule 26*

## Description

Artificial Solutions is a leading global vendor of conversational artificial intelligence (AI) software to multinational enterprises. Headquartered in Sweden, the company comprises around 106 people.

## Company information

| | |
|---|---|
| CEO | Lawrence Flynn |
| CFO | Chris Bushnell |
| Chairman | Åsa Hedin |

+46 8 663 5450
www.artificial-solutions.com

## Diary

| | |
|---|---|
| 18 May | 1Q'20 results |
| 17 Jun | AGM |
| 30 Jul | 2Q'20 results |
| 29 Oct | 3Q'20 results |
| 4 Feb'21 | FY'20 results |

## Analyst

Milan Radia 020 7194 7622
mr@hardmanandco.com

# ARTIFICIAL SOLUTIONS

## Conversational artificial intelligence made real

**Strong operational and financial progress over the past 12 months includes a series of contract wins with major organisations, particularly via a growing base of Tier 1 systems integrator partners. The COVID-19 pandemic brings uncertainty, but Artificial Solutions continues to make progress due to healthy contracted backlog and ongoing sales cycles. Compared with the current market capitalisation of ca.SEK250m (€23m), the recent valuation of the patent portfolio alone came in at a midpoint of €128m, while our discounted cashflow analysis suggests an implied fair equity value of €116m.**

- **Continued strong customer momentum:** 12 major new-name customers were added in 2019, taking the total to 31. Skoda (part of VW), Circle K (a Nordic retailer) and Swisscom extended their rollouts, while a large US telco (AT&T, we believe) is expanding from supporting 150,000 users to over 11m.
- **Visibility for the next two quarters is relatively high:** Much of the revenue reported in these periods will be drawn from contracted backlog. New product launches continue; the recent launch of the Tiva virtual assistant provides HR and IT support for remote working – a good example of innovation agility.
- **Embedded in the revenue model is a high level of scalability:** A new guidance metric anticipates that usage revenue, driven by increasing transaction volumes from the large customer wins, will represent ca.80% of total revenue by end-2022. These trends are highly positive for the margin profile.
- **Financing:** In February, the company completed a rights issue to raise SEK 120.5m (€10.8m), which is expected to take the business through to positive operating cashflow by end-2020. This raise precedes finalisation of the debt refinancing – we anticipate further announcements in coming months.
- **Investment summary:** The drivers of conversational artificial intelligence (AI) adoption are resilient and secular in nature, reflecting the growing adoption of automation technologies by enterprises globally. The growing number of case studies of major customers expanding their deployments of Teneo are consistent with the expected step changes in high-margin usage revenue.

## Financial summary and valuation

| Year-end Dec (€m) | 2018 | 2019 | 2020E | 2021E | 2022E |
|---|---|---|---|---|---|
| Total income | 6.1 | 6.4 | 10.4 | 15.5 | 21.5 |
| Reported EBITDA | -9.3 | -12.7 | -5.3 | 0.3 | 4.5 |
| EBITDA margin | -152% | -197% | -51% | 2% | 21% |
| EBIT | -11.5 | -13.8 | -6.5 | -1.0 | 3.1 |
| Pre-tax profit | -12.9 | -17.1 | -9.5 | -3.7 | 0.6 |
| Net income | -12.9 | -17.1 | -9.5 | -3.7 | 0.6 |
| | | | | | |
| EV/Revenue (x) | 5.6 | 5.3 | 3.3 | 2.2 | 1.6 |
| EV/EBITDA (x) | -3.7 | -2.7 | -6.5 | 119.5 | 7.6 |
| EV/EBIT (x) | -3.0 | -2.5 | -5.3 | -33.2 | 11.2 |

*Source: Hardman & Co Research*

# Table of contents

# Investment summary

*Solid operational and financial progress against stated key objectives*

Amid the immense valuation disruption associated with the COVID-19 pandemic, there will be significant disconnects that emerge between individual company valuations and their business fundamentals. Artificial Solutions may be one such company, having continued to make solid operational and financial progress against its stated key objectives. Having cultivated an exceptionally strong base of global systems integrator partners, the company's ability to progressively refocus and reduce its own professional services activities has been greatly facilitated. The benefits of this strategic transformation, implemented and executed by the current management team are being seen in i) new wins with customers that would not be directly accessible to Artificial Solutions, and ii) in a steep improvement in the gross margin profile.

## *Enterprise-grade platform focused on the largest global enterprises*

From the outset, Artificial Solutions has been clear in its focus on global enterprises and large public sector organisations. These segments were identified as most suitable for Artificial Solutions' high-end conversational AI solutions. The Teneo platform can be readily deployed in around 40 languages, with enterprise-grade scalability in terms of processing capacity. Ultimately, this is really derived from customer enquiries and other interactions being resolved without human intervention. This success rate is a driver of competitive advantage for Artificial Solutions versus less sophisticated solutions, with the company finding that a significant proportion of its new customer wins are with enterprises that have tried alternative solutions, usually provided by the major technology platforms.

## *Conversational AI is part of a broader enterprise automation trend*

Artificial Solutions' products are part of a broader secular trend of enterprise adoption of automation platforms and solutions, i.e. hyperautomation. Gartner predicts that, by 2024, organisations will lower operational costs by 30% by combining hyperautomation technologies with redesigned operational processes. One of the stronger trends in enterprise IT for the last few years has been the widespread adoption of robotic process automation (RPA). RPA is the use of software robots to handle routine, repetitive, rule-based or predictable digital tasks or processes. The aim is for these robots to eliminate manual/human involvement in these processes. RPA has been popular with enterprises as they grapple with competitive pressure and margin erosion. Market size estimates suggest that the worldwide RPA market will be worth close to $4bn in 2020 (*source: Statista*), while the market is expected to exceed $5bn by 2024 (*source: Marketwatch*). In fact, RPA is only one part of the range of automation tools and platforms available to enterprises and, commonly, a number of these solutions are being implemented. There is an obvious interface between a chatbot and an RPA engine, whereby the chatbot feeds inputs into the RPA engine. This major opportunity has barely been exploited to date.

## *Tiva virtual assistant for remote working*

The recent Tiva virtual assistant launch is particularly timely, as it provides automated HR and IT support to employees working remotely. As one might expect, HR and IT departments are experiencing exceptionally high volumes of queries from staff on a range of issues. The Tiva chatbot is designed to answer many of these queries in an automated fashion. The system is pre-loaded with a wide range of HR and IT dialogues that can be adapted by non-technical personnel with the appropriate specific information that reflects the policies and decisions of the specific employer. Tiva can be made accessible through multiple channels – telephone, online chat, Microsoft Teams, etc. In common with the Teneo platform, more broadly, Tiva can be readily deployed in multiple languages.

## *One sizeable deal slipped from 4Q'19 into 2020*

4Q'19 results followed the January update, in which expectations for FY'19 were reset due to a delayed large order with a major US customer. The reset of management expectations for 4Q'19 was due to one very large deal with a US client slipping beyond 4Q. On the earnings call, management was clear that work on the project with the partner in question was ongoing, with an expectation that the deal would be signed in 2020. Accordingly, the lower order intake in 4Q is seen as a transitional impact. In fact, on 26 March 2020, the company announced a major SEK 10.6m (ca.€1m) follow-on order with Swisscom, which is an existing customer, confirming that the underlying level of activity of the business remains solid. This is not the deal that slipped from 4Q, and we understand that work on the latter remains ongoing.

## *Positive operational trends*

The quarterly results during FY'18 and FY'19 confirm a series of positive trends within the business:

- continuing wins of new-name major customers, together with follow-on deals, reflecting a positive impact on customer experience and return on investment (ROI) from Teneo deployment;
- consistent growth in the proportion of order intake and revenue contributed by systems integrator partners;
- strong momentum in expansion of use cases by key customers, resulting in potentially sharp uplifts in usage revenue over 2020-22E;
- gross margin increases ahead of forecasts, stemming primarily from a reducing proportion of professional services within the revenue mix; and
- lengthening revenue recognition periods within the order backlog, reflecting the willingness of customers to enter into longer-term commitments.

## *Artificial Solutions is established as a leading global AI vendor*

Artificial Solutions continues to build a growing level of industry recognition for its innovative conversational AI solutions. In January 2020, Ovum, a leading technology industry analysis provider, recommended Artificial Solutions as a market leader for Intelligent Virtual Assistant solutions. Ovum deems Teneo's innovative technology to be best-of-breed, highlighting the hybrid approach of combining machine learning with a native understanding of language itself.

***An established leading global AI vendor, deemed "best-positioned" in its sector***

In 2018, ETR Research published the results of its survey of approximately 700 enterprise CIOs from companies that it calculated represented ca.$300bn in annual IT spend. Of these participating companies, 229 were in the top Global 2000 IT decision makers (ITDMs), and 66 were in the Fortune 100. The overlap between these enterprises and Artificial Solutions' target market is, therefore, significant. Artificial Solutions was ranked third among all "emerging technology companies to keep an eye on" and, perhaps even more significantly, was deemed to be the best-positioned company in its sector.

## *Valuation*

The strong progress Artificial Solutions has made since the listing on the NASDAQ First North exchange in Stockholm in March 2019 has not been reflected in the share price, due to various technical factors. The company's technology market leadership is confirmed by the extensive patent portfolio, which has been subjected to detailed valuation analysis on multiple occasions. Two equity fundraisings have allowed new institutional shareholders to join the register, but recent market volatility has left the stock trading at a fraction of the valuation that has been attributed to the company's patent portfolio alone. A recent independent valuation

of the company's patent portfolio indicates the value of the patent portfolio to be in the range of $125m to $153m, far in excess of the company's current enterprise value. Our discounted cash flow (DCF) analysis indicates an implied fair equity value of €116m. These valuation parameters compare with the current market capitalisation of the company of ca.€22m.

### *Risks*

- The current COVID-19 pandemic is, unfortunately, a source of risk and operational disconnects for all companies around the world. The extent of the impact will inevitably vary across industries and geographies, and the technology sector is undoubtedly seen as relatively resilient. From Artificial Solutions' perspective, the trend towards automation is likely to be accelerated by the current lockdowns, as enterprises start to appreciate that the Teneo platform can assist with keeping customer service and interaction ongoing during such situations. In fact, the recent launch of a product designed specifically to address the remote working environment for HR, IT and related internal requirements is an example of how the company's flexible platform can create highly relevant enterprise chatbots. We discuss the Tiva offering in more detail in this report.
- Competing with some of the world's largest technology companies brings challenges, such as keeping pace with developments, retaining talented people and creating enterprise mindshare versus strong brands.
- Systems integrators are a highly attractive and scalable route to market but may reduce a company's visibility into potentially lengthy sales cycles. However, to date, Artificial Solutions has proven adept at managing these factors, while reaping the benefits of access to customers – for example, US Government departments, which would otherwise not be accessible to the company.
- Funding is invariably a risk factor for a company such as Artificial Solutions, which is experiencing cash burn as it invests in further product/platform development and sales and marketing. The recent equity raise resolves short-term funding requirements, with discussions regarding refinancing of the company's existing debt in progress.

# 4Q'19 results

The company's 4Q'19 results announcement followed the trading update on 19 January 2020, in which expectations for FY'19 were reset due to a delayed large order with a major US customer, which is being addressed in conjunction with an existing systems integrator partner. Artificial Solutions' management was clear, on the 4Q earnings call, that work on the details of this particular project by Artificial Solutions and its partner was continuing, and that the contract and follow-on orders were expected to be signed in 1H'20.

The 2019 impact on revenue and EBITDA from this delayed project was modest, at ca.SEK 0.5m. The larger impact was on order intake, which came in at SEK 17m in 2019, versus guidance in broad terms of SEK 40m (based on management's objective of delivering YoY order intake growth in line with overall market growth of 35%).

**Artificial Solutions – 4Q'19 results**

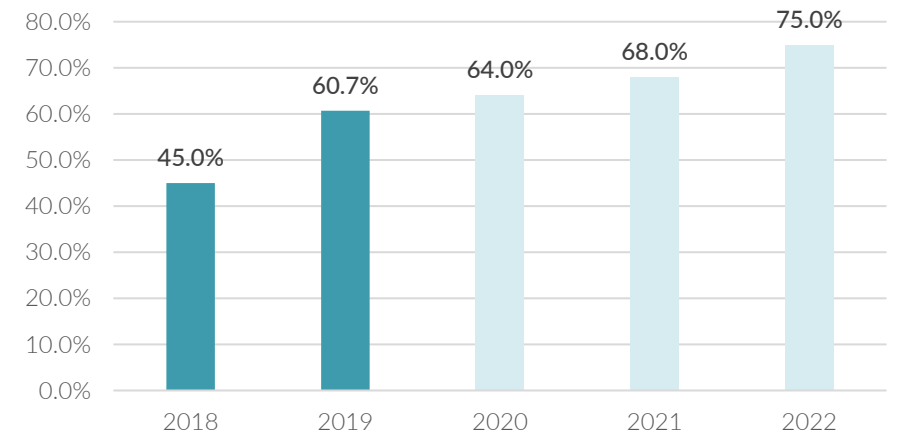
| (SEKm) | 4Q'19 | 4Q'18 | FY'19 |
|---|---|---|---|
| Net sales | 11.0 | 11.5 | 49.1 |
| Gross profit | 6.1 | 3.1 | 29.8 |
| Gross margin | 55% | 27% | 61% |
| Adjusted EBITDA | -30.6 | -35.4 | -112.8 |
| Operating loss | -26.1 | -34.0 | -146.0 |
| Adjusted operating loss | -26.1 | -33.9 | -117.5 |

*Source: Company data, Hardman & Co Research*

# Gross margin outperformance

The gross margin continued to trend upwards: 61% for FY'19 overall and 55% in 4Q, on track to get to the company's target level of 70% during 2020.

**Artificial Solutions – gross margin trend, 2018-22E**

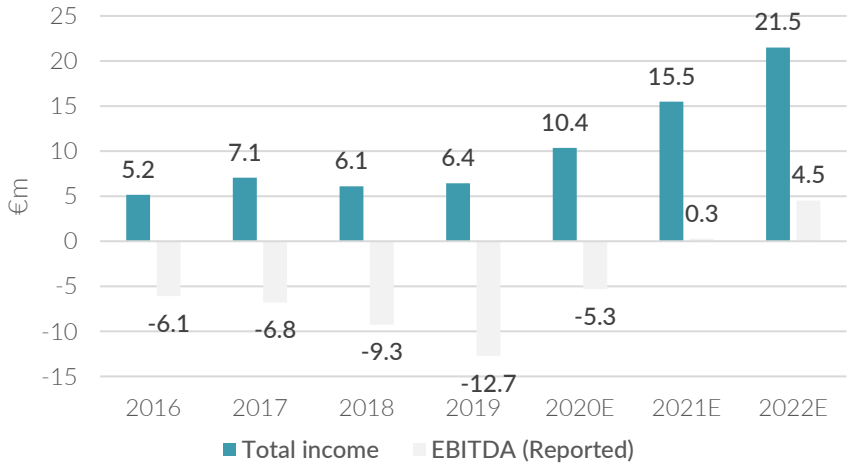



*Source: Company data, Hardman & Co Research*

This continues to be driven by a growing proportion of licence sales and usage fees with the revenue mix, alongside diminishing revenue from implementation of professional services, as they are increasingly being delivered by Artificial Solutions' systems integrator partners. At the time of our initiation of coverage, in March 2019, we had been expecting a gross margin of 57% in 2020 and 59% in 2021. Reflecting a stronger-than-expected order intake and revenue contribution from systems integrator partners, the gross margin, as noted above, was 61% in 2019. We are now expecting gross margins of 64% in 2020, 68% in 2021 and 75% by 2022.

Performance against the company's primary stated objectives has been favourable in the last 12 to 24 months, and the revenue trajectory remains healthy, as confirmed by recent contract win announcements. While the COVID-19 pandemic may impact sales cycles globally, the impact on Artificial Solutions should be relatively muted, due to the drive by enterprises to automate customer-facing activities and strong systems integrator partnerships.

**Artificial Solutions – total income and EBITDA (€m)**




*Source: Company data, Hardman & Co Research*

## Inherent revenue scalability

*Revenue growth from combination of expansion of revenue from existing customers and new customer additions*

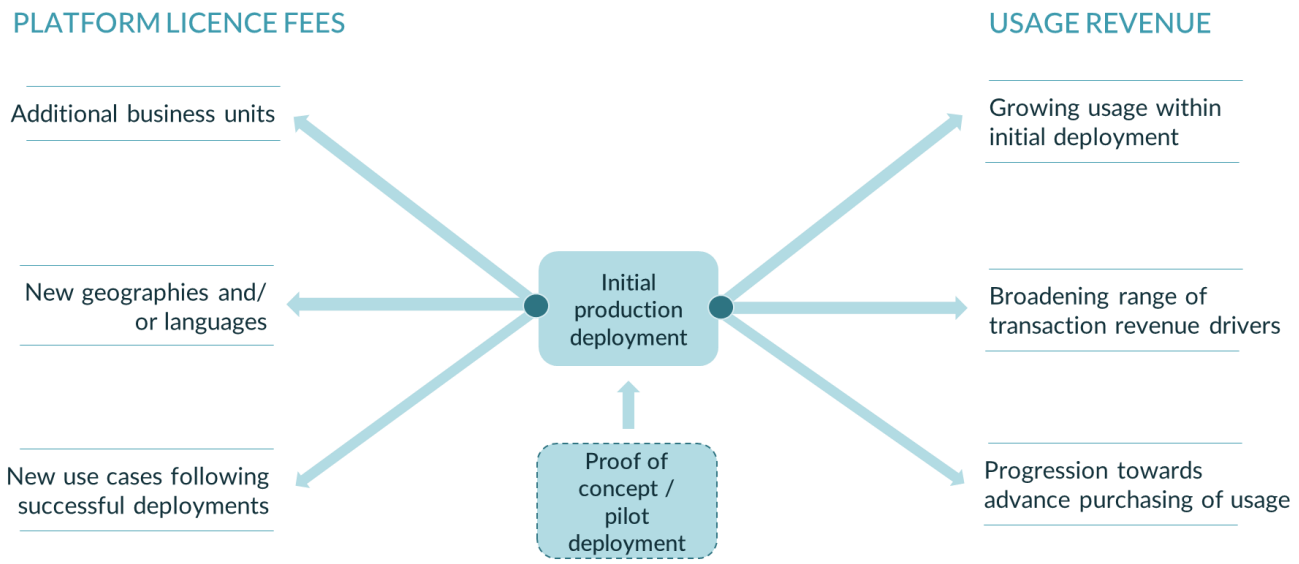
Artificial Solutions sells term licences that grant an enterprise the right to use the Teneo platform for a specified period – usually two or three years. Alongside the term licences, and associated support and maintenance contracts, each customer contract incorporates a usage-based revenue element. The enterprise-grade nature of Artificial Solutions' conversational AI capabilities allows the company to focus its attention on the largest enterprises with the highest numbers of users.

We expect the revenue growth of the business to be driven by a combination of expansion of revenue from existing customers and new customer additions. The growth in revenue from existing customers falls into multiple categories:

- existing proof-of-concept deployments migrating to live production, at which point platform licence fees become payable;
- live deployments being expanded, whether into new geographies (and hence possibly additional languages), new functional silos/business divisions, or additional channels to market; and
- usage revenues, which are generated as transaction volumes being processed by the applications built on Teneo, increase – requiring additional fees to be paid by customers.

The chart below seeks to distinguish between platform licence fees and the usage revenue that will subsequently be generated by these deployments.

**Artificial Solutions – inherent revenue scalability**




*Source: Hardman & Co Research*

Today, the revenue base comprises primarily initial deployments by customers in a particular slice of their business in the form of proof-of-concept engagements and, increasingly, live production deployments. These are typically across one division of its customers' operations. Management expects a consistent flow of new proof-of-concepts to be added, while existing proof-of-concepts will continue to convert into live deployments, representing new customer growth.

Over time, the existing customers will drive revenue in two major ways: through greater usage metrics within the existing deployment, or through a decision, typically after witnessing positive outturns, to broaden the deployment into other divisions, geographies, languages, etc.

Alongside these trends, usage-based revenue should, over time, become the largest part of Artificial Solutions' revenue, as major enterprises deploy conversational AI solutions built on Teneo on a wider basis and experience growth in transactional volumes.

# Growing list of successful case studies

*Expanding list of major customers:*

Central to the expectation of high growth in usage revenue is the expanding list of major customers that have not only moved into live production environments with the Teneo platform but have also already decided to add to their initial deployments. In the case of Skoda, this is across incremental countries and languages. In the Circle K example, there is an intention to roll out the customer services capabilities of Teneo across regions with thousands of stores, while maintaining corporate consistency.

## *Skoda case study*

*Skoda*

The Volkswagen Group (VW) is an ideal example of additional deployments of Artificial Solutions' conversational AI platforms, in turn increasing revenue. For VW, one of the primary initiatives has been a progressive deployment of Teneo across an increasing number of brands. Within individual brands, Teneo has been applied to an increased number of functional activities and deployed across a growing footprint of countries.

Skoda is a very good example of these trends. Part of the VW Group, Skoda started with Teneo in its Spanish business, working with Accenture as a systems integrator. A conversational chatbot, or intelligent virtual assistant, called *Lucy*, was created to bring an enhanced digital experience to visitors to the Skoda website. *Lucy* interacts with website visitors, asking them questions designed to inform Teneo what they are seeking to achieve. The nature of their vehicle usage, financial budgets, number of people in the family, etc., are data points that are obtained – in turn allowing vehicle recommendations to be made on an automated basis.

Where the real value is added is thereafter, as *Lucy* then guides the customer through a vehicle configurator workflow, adding warranties and future service packages. The end-objective is to book a test driver for the customer at a time and location that are convenient for the customer. Skoda has reported a substantial increase in website conversion rates, primarily a function of a much improved rate of website visits turning into test drives of vehicles that have been identified as suitable for the customer.

After successful deployment in Spain, the Teneo platform has been rolled out to additional countries and in multiple languages – an integral capability of the Teneo platform. For Artificial Solutions, beyond the additional licence fees for the additional countries/languages in which the *Lucy* chatbot is deployed, there are transaction-based usage fees, which are expected, over time, to become a major component of the company's revenue.

## *Circle K case study*

*Circle K*

Circle K is part of the Couche-Tard group, which is a Canadian operator of convenience stores across the Americas, Europe and parts of Asia. Circle K is at the heart of the company, with over 16,000 stores worldwide.

A notable statement in the most recent Couche-Tard investor presentation for March 2020 is the following stated area of focus:

> *"Be recognized by our customers for a differentiated experience, in the way we deliver and continuously improve as we innovate the customer journey."*

The adoption of Artificial Solutions' Teneo platform is part of the company's initiatives to create competitive advantage through differentiation. Circle K was seeking to develop an intelligent conversational chatbot that could reduce the volume of calls being handled by the customer support teams across the B2C and B2B segments. The company notes that Teneo was selected as it offered the ability

to create corporate consistency across content, languages and technology. The decision to select Teneo was made by a combination of Circle K's business users and technology experts, who were collectively seeking a system that was readily usable by non-expert users.

This customer case study exemplifies some of the competitive advantages that Artificial Solutions cites, including the ease of use and ability to readily deploy core chatbot capabilities across multiple languages, while maintaining complete consistency. There is no doubt that, in this instance, given the potential scale of the rollout, Circle K will have considered the full range of options available across the market.

## *US telecoms operator*

***US telco operator***

A particularly sizeable customer in the US telecoms sector has decided to expand its solution to support over 11m customers. No further detail has been provided on this deployment, but we are aware that AT&T is a long-standing customer in the US telecoms segment.

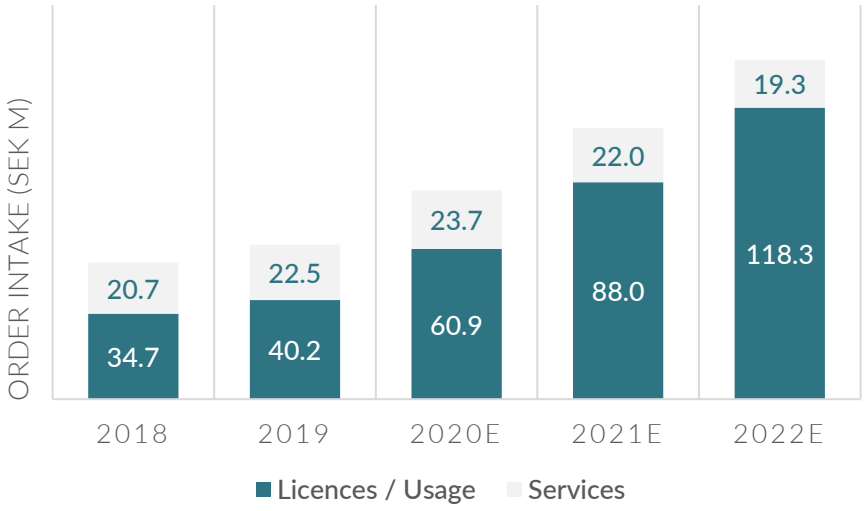
# Order intake and backlog

## Order intake

*FY'19 order intake of SEK 62.7m...*

The company's stated target is to grow its order intake in excess of the growth rate of the Natural Language Processing (NLP) market over the medium to longer term. Artificial Solutions' order intake metric is confined to the value of orders that are contractually committed during the period, with no inclusion of transaction-based usage revenue, which would generally be extrapolated, rather than contracted.

**Artificial Solutions – order intake (SEKm)**




*Source: Company data, Hardman & Co Research*

## Order backlog

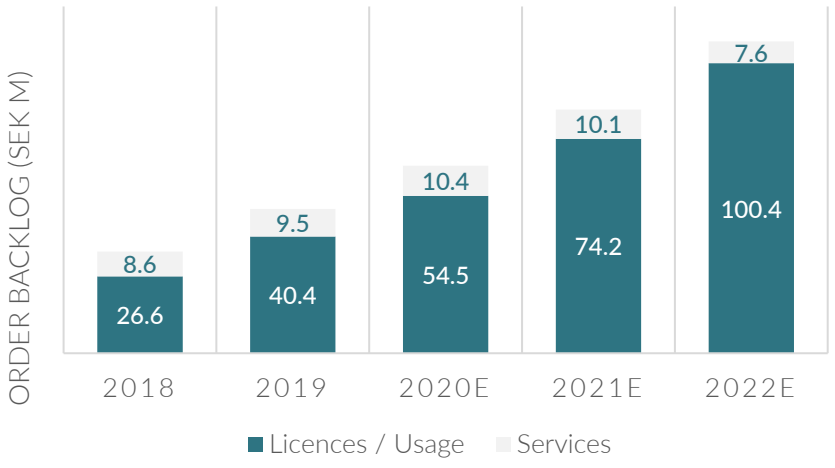
*...and SEK 49.9m order backlog*

Order backlog comprises the value of contractually committed orders received from contractors that have not yet been recognised as revenue. This is a key metric upon which management rightly places emphasis as a barometer of the underlying health of the business, while providing an indication of future revenue growth.

Artificial Solutions places considerable emphasis on the composition of its order backlog, which has grown significantly over the past few years, and is expected to continue to expand strongly over our forecast period, as set out in the chart below. As noted earlier, the contracted backlog excludes any usage revenue, which, as discussed, is expected to be a disproportionate contributor to revenue by 2022.

The closing order backlog at the end of FY'19 was SEK 49.9m, representing an increase of 42% YoY, of which we expect ca.68% to convert into revenue in 2020, particularly licence revenue. The growing proportion of backlog that is scheduled to be delivered in 2021 and beyond is indicative of the growing visibility stemming from longer-term customer commitments. The latter are a function of increasing customer confidence that Teneo is delivering an appropriate return on investment and an improvement in customer interaction metrics.

Artificial Solutions – order backlog (SEKm)



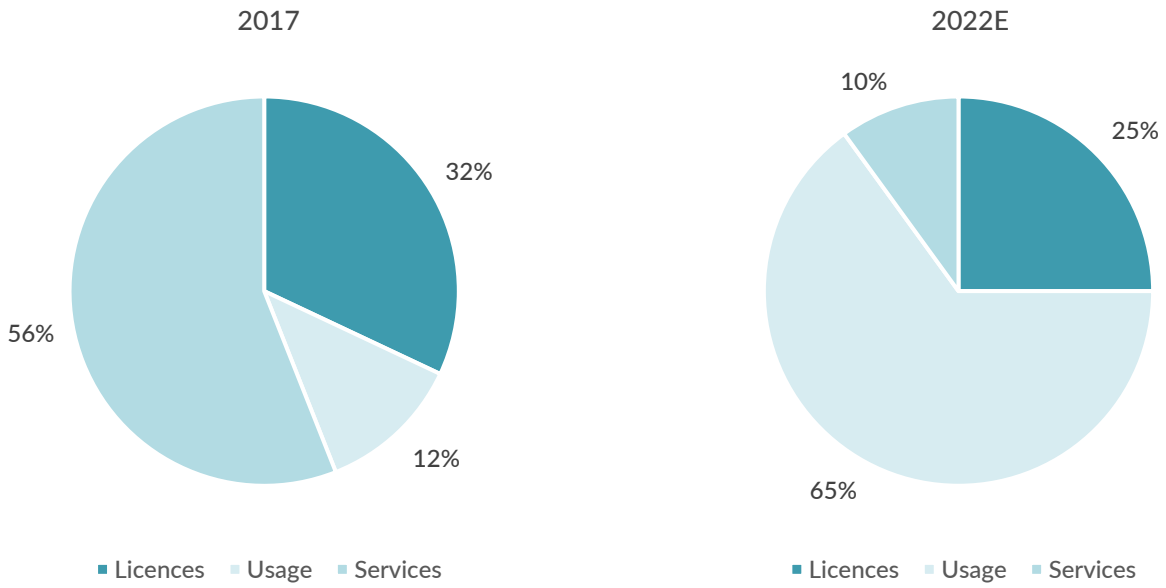

*Source: Company data, Hardman & Co Research*

## Usage revenue should come to the fore

*Artificial Solutions expects usage revenue to represent at least 80% of total revenue by end-2022*

Artificial Solutions' management has added a further guidance metric, which is that usage revenue is expected to represent at least 80% of total revenue by the end of 2022. This is a major statement by the company when considered in the context of the 16% of total revenue accounted for by usage revenue in FY'19. This guidance is inherently customer-driven. Usage revenue refers to the element of the pricing model that is dependent on the number of sessions, transactions, connections or period of usage. The specific details will be agreed with each individual customer, together with the pricing structure that will apply. Our conservative estimate is that usage revenue will represent 65% of total revenue by end-2022.

Artificial Solutions – revenue breakdown, FY'17 and FY'22E (%)



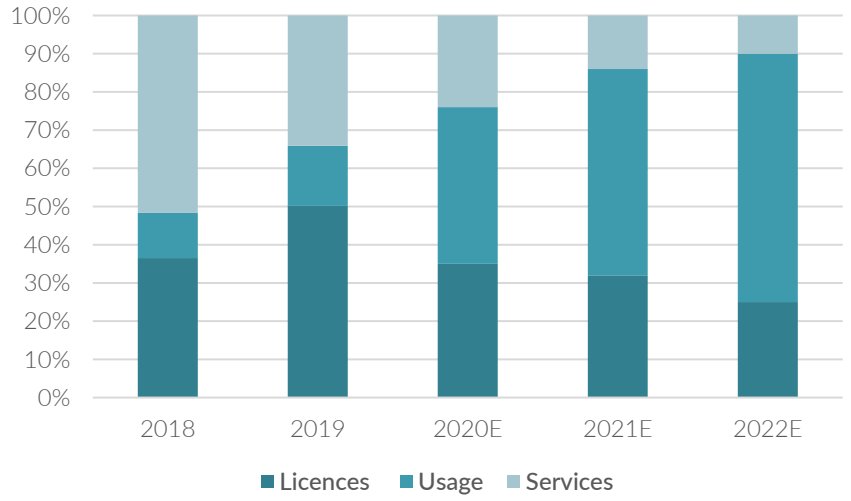

*Source: Company data, Hardman & Co Research*

Artificial Solutions agrees rate cards with each of its large customers that are linked directly to the expected ROI. The alignment between the company and its customers is an attractive feature of the business model. Growing usage fees are correlated directly with cost savings being generated by end-user adoption of the automated customer interaction option. Volume discounts are also a characteristic of agreements, but, given the scale of the enterprises concerned, the absolute numbers are typically quite large for these discounts to become activated. In some cases, Artificial Solutions' usage or transaction-based revenue is dependent on the number of correctly interpreted data points. Customers' interests, therefore, become aligned with those of Artificial Solutions in terms of delivering lower error rates and faster throughput.

However, the very large uplift in usage revenue implied by the 2022 guidance metric reflects the line of sight that management has to a sharp prospective uplift in transaction metrics and, in turn, usage revenue, over the next two to three years. It is noted that the company's largest customers are all capable of delivering usage revenue in excess of SEK 60m (ca.€5.5m) p.a., and they are expected to trend towards this scale of usage revenue within the next two to three years.

Usage revenue is typically not captured in the order intake and contracted backlog metrics discussed above, as customers do not commit in advance to specific levels of usage revenue. The indicators of a potential uplift in usage revenue are, therefore, customer-specific. In this respect, the growing list of case studies of major customers expanding their deployments to additional regions and languages is consistent with the company's expectation of strong sequential growth in usage revenue over the next few years. Some important recent case studies are described in the next section.

**Artificial Solutions – evolving revenue mix, 2018-22E**




*Source: Company data, Hardman & Co Research*

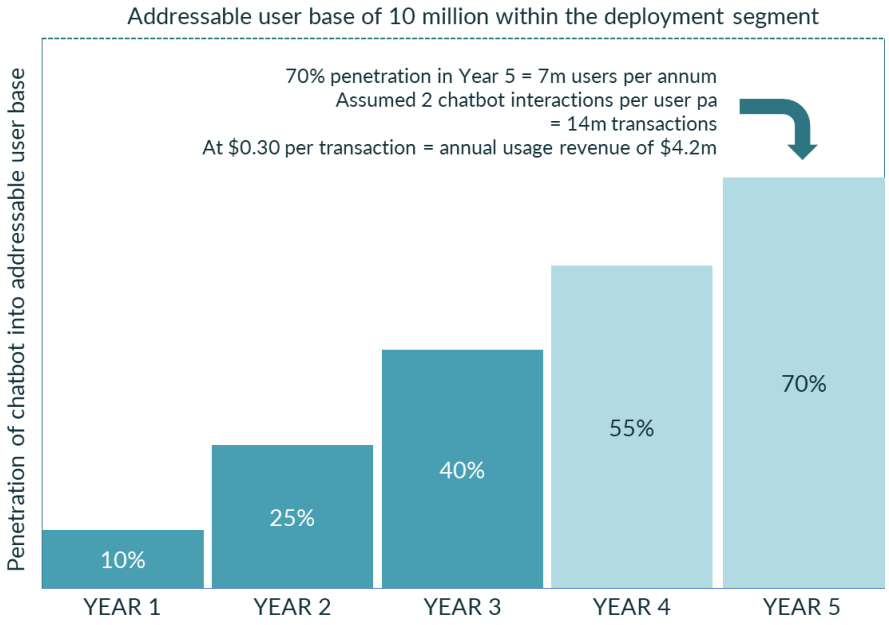
The schematic below sets out an example of how usage revenue could evolve for a large customer. While this is a stylised example and not based on specific customer data, our starting point is the expansion that was announced for 4Q'19 of a large US telecoms operator customer from an addressable user base of 0.5m people to around 11m people. This, of course, suggests a very large increase in the number of potential addressable transactions for the applications built upon Teneo by that customer.

Taking into account that the agreed transaction fee structure is generally based on a volume-driven sliding scale, a minimum fee might be cents per "transaction". A transaction might comprise either a call that is successfully handled by a virtual digital assistant without requiring referral to a human customer services assistant, or an online chat session with an automated chatbot. The chart below makes assumptions regarding the extent to which an addressable base of 10m customers interact with the chatbots built on Teneo, and also on the proportion of interactions that are handled entirely by the chatbot. One would expect the success rate to progressively improve as Teneo learns from the customer-specific interactions through the platform.

By way of this simple example, if, by the third year post implementation of Teneo, 40% of the addressable users interacted with the chatbot twice per year and had their queries resolved, this would represent 8m transactions on an annual basis. At a transaction fee of only $0.30 per transaction, this would equate to $2.4m of usage revenue. On the same basis, assuming 70% penetration by year five, the annual usage revenue for two chatbot transactions p.a. per user would be $4.2m. These are modest assumptions, and the outcome of the analysis is supportive of management's assertion that the larger active customers are all capable of generating usage revenue in excess of €5m each.

It is worth remembering that this fee would apply to the transactions that were successfully handled by the chatbot; so the customer would be saving multiple dollars for each customer interaction that did not need to be handled by a human. The ROI for the customer is substantial, but this only works if the chatbot is sophisticated enough to deliver resolved transactions. As we reiterate in this note, Artificial Solutions is often selected by large enterprises once they have tried other, less capable solutions that offer far less customisation and require specialist skills for changes to be processed.

**Artificial Solutions – stylised view of usage revenue evolution**




*Source: Hardman & Co Research*

# The process automation opportunity

## *Enterprise adoption of RPA*

*Widespread adoption of RPA in enterprise IT as part of hyperautomation trends*

One of the stronger trends in enterprise IT for the last few years has been the widespread adoption of robotic process automation (RPA). RPA is the use of software robots to handle routine, repetitive, rule-based or predictable digital tasks or processes. The aim is for these robots to eliminate manual/human involvement in these processes, thereby improving efficiency and productivity, and reducing cost. In essence, the robots are programmed to interact with other applications and data sources in a similar fashion to how a human worker would do so.

RPA robots tend to be most commonly deployed for processes that operate according to a strict workflow, set of rules and business logic. Back-office processes are often well-suited to the use of RPA, with human intervention confined to exception handling. The robots fall into multiple categories, ranging from "unattended" (deployed on simple, highly structured tasks and processes), "attended" (handling more advanced tasks and working hand-in-hand with humans) and "cognitive process automation" (supporting more complex processes, including the use of unstructured data).

## *Hyperautomation*

RPA has been popular with enterprises as they grapple with competitive pressure and margin erosion. Market size estimates suggest that the worldwide RPA market will be worth close to $4bn in 2020 (*source: Statista*), while the market is expected to exceed $5bn by 2024 (*source: Marketwatch*). In fact, RPA is only one part of the range of automation tools and platforms available to enterprises and, commonly, a number of these solutions are being implemented.

Gartner defines "hyperautomation" as an approach in which organisations rapidly identify and automate as many business processes as possible. It involves the use of a combination of technology tools, including, but not limited to, machine learning, packaged software and automation tools to deliver work. Gartner predicts that, by 2024, organisations will lower operational costs by 30% by combining hyperautomation technologies with redesigned operational processes.

## *Conversational AI as a front-end to RPA*

AI is not always part of the RPA offering, but, increasingly, AI is becoming an integral element of RPA solutions in order to inject more intelligence into the process automation, allowing more complex processes to be automated. Conversational AI is part of the hyperautomation trend, with many enterprises seeking to expand their customer interaction capabilities across multiple channels in a cost-efficient manner and without ramping up headcount.

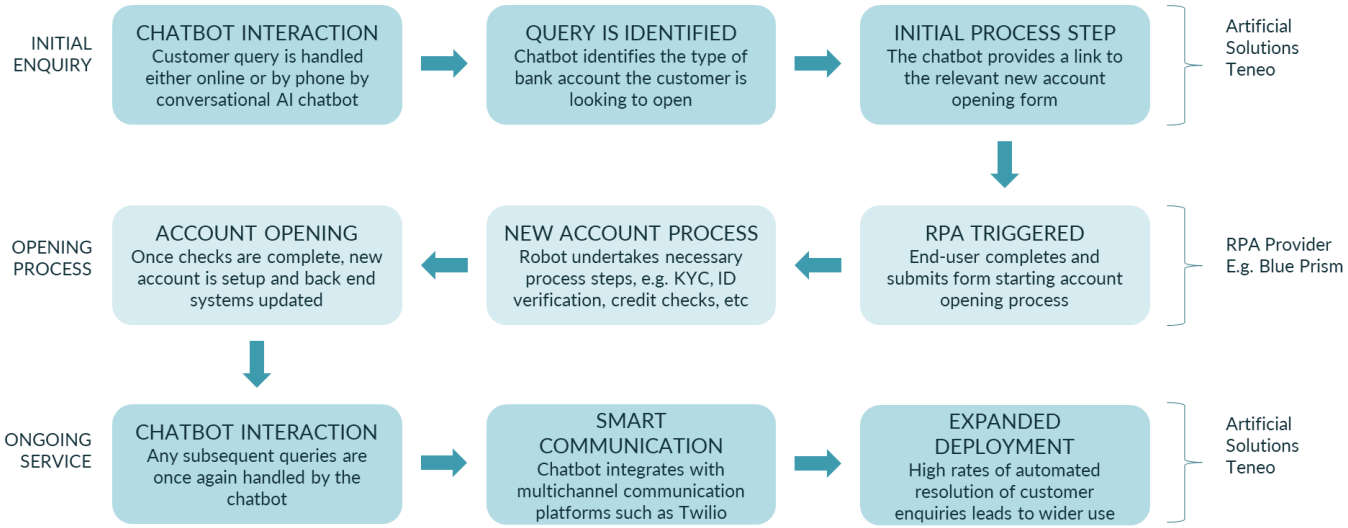
RPA is seen as being a couple of years ahead of conversational AI in terms of take-up, and now creates a compelling base of process automation deployments into which Artificial Solutions and its partners can sell Teneo solutions. There is an obvious interface between a chatbot and an RPA engine, whereby the chatbot feeds inputs into the RPA engine. A key aspect of Artificial Solutions' Teneo platform is the combination of natural language processing and machine learning algorithms to improve the AI models that are embedded in the platform.

The RPA vendors, including major providers, such as UiPath and Blue Prism, are seen as motivated to integrate with leading chatbots, as conversations that are captured through automated interfaces will likely trigger a greater volume of transaction flow through their automated process platforms, in turn generating higher usage/transaction fees. Enterprises are beneficiaries of these seamless flows through greater automated processing and reduced cost, making them supporters

of this growing trend in favour of closer integration. Notably, a key attribute of the Teneo Fusion module, which was launched in 2019, is easier integration with RPA platforms.

End-to-end automation is key to providing high-quality self-service options that customers are demanding and increasingly taking for granted. The example below is a stylised view of the role that Artificial Solutions' chatbots might play in the process to open a new account – in this case in a financial services context of some description. A high level of automation is feasible right from the point at which the initial query is made to the bank through to completion of the account opening process and ongoing customer service thereafter. The processing timescales can be highly compressed compared with manual processes, resulting in significantly reduced costs and happier customers.

**Conversational AI working hand-in-hand with RPA**



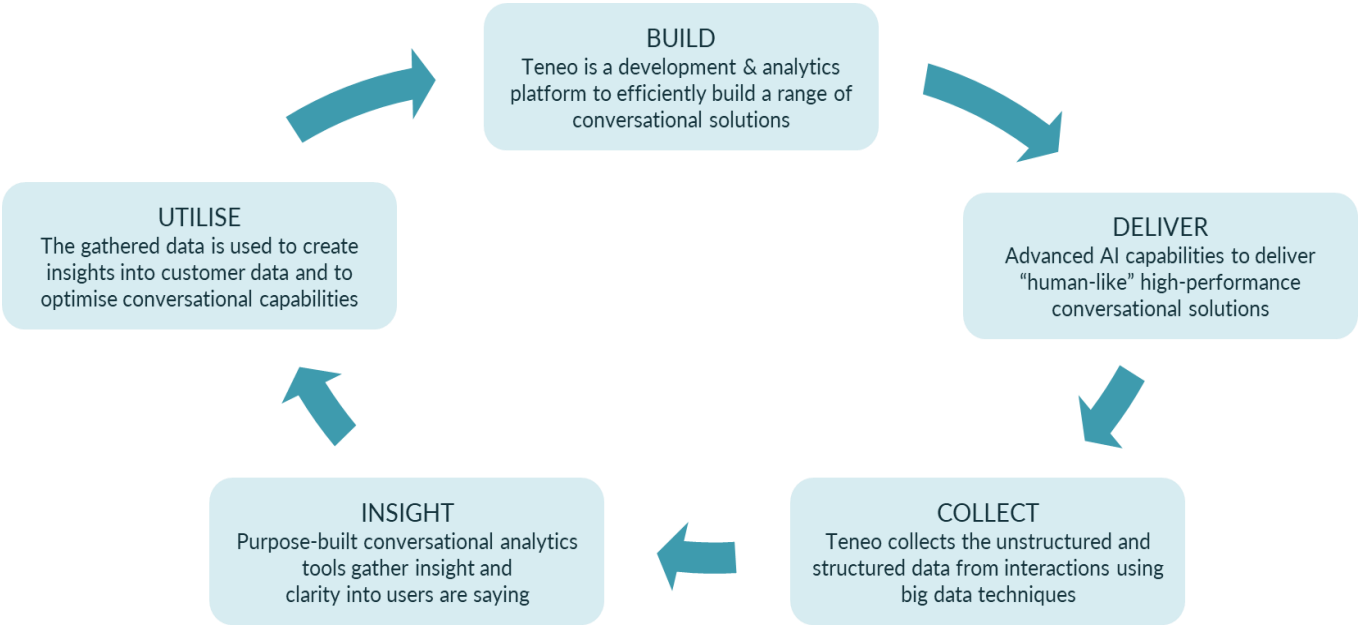

*Source: Hardman & Co Research*

RPA itself is evolving and seeing the injection of AI and machine learning capabilities in order to allow the robots to handle more advanced workflows and other tasks. This will not encroach on Artificial Solutions' areas of focus, as its specialist focus is difficult to replicate – rather, we expect further partnerships along the lines of the announcement with Blue Prism.

## *Teneo is highly advanced and constantly improving*

The Teneo platform is constantly collecting data to generate insights, which are analysed using the purpose-built tools embedded in the platform, in order to optimise its capabilities. It is not only structured data that is collected by Teneo, but unstructured data too; for example, the transcript text of an online chat between a customer services representative and a consumer. The resulting data sets are huge, a topic that we come on to later in this section. It is this data that Teneo uses to learn and optimise its algorithms, so that the quality of conversations is consistently improved. New product launches tend to fall within the workflow categories shown in the chart below. Enhancement and functionality enhancement projects are ongoing in most of these areas.

Artificial Solutions – Teneo process workflows




*Source: Company data, Hardman & Co Research*

### *Integration with automated communication platforms*

Artificial Solutions also envisages significant synergies from integrating Teneo with other constituents of the enterprise platform, which is consistent with the hyperautomation theme. One example that has been highlighted is automated multichannel communication platforms, with providers including companies such as Twilio and Nexmo, which are leveraging a variety of messaging and communication platforms and integrating them into single platforms for the enterprise. Artificial Solutions' management has, in the past, hinted that partnership discussions on this front are under way.

## Strategic focus on indirect revenue

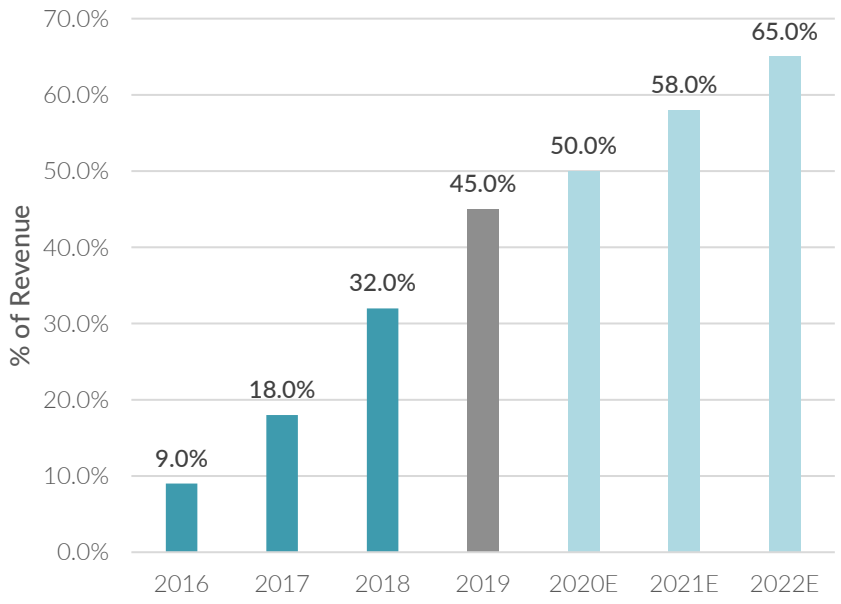
*Routes to markets evolved significantly towards systems integrators*

In recent years, the company's routes to markets have evolved significantly towards systems integrators, which, in 2019, delivered ca.45% of Artificial Solutions' total revenue, up from 32% in the previous year. As a consequence, the proportion of licence and support/maintenance revenue within contract values has increased, with much of the workload of the services pre- and post-sale being delivered by partners. These trends are expected to continue in the same direction over the next few years, with the partner share of revenue expected to reach 65% by 2022.

Correspondingly, we estimate that direct sales will represent around 35% of the company's revenue by 2022, compared with over 90% in 2016. While this requires a share of revenue to be paid to partners, Artificial Solutions has demonstrated the benefits of leveraging the global reach of these organisations into the enterprise segment with a number of contract wins that the company could not have achieved on its own. This has particularly been the case in the US Government sector, where Deloitte has proven to be an effective partner.

In a large enterprise context, there will likely be a need to integrate the Teneo platform with multiple enterprise applications. While Teneo is designed to be user-friendly to allow non-specialists to create conversational AI applications, the integration element will typically lend itself well to the involvement of systems integrators.

**Artificial Solutions – revenue from systems integrator partners, 2016-22E (%)**




*Source: Company data, Hardman & Co Research*

### *Reliance on partners reduces visibility*

The other side of the coin to the company's focus on large, multinational enterprises via systems integrator partners is longer sales cycles, with greater scope for delays and reduced visibility into the timing of contract signatures. Artificial Solutions will, in most cases, have a direct dialogue with prospective customers, but the negotiations and closing of the sale will invariably lie in the hands of the partner. An example of an unexpected deal slippage, as mentioned earlier, was seen in 4Q'19, albeit with a relatively modest revenue impact in the period. As the company grows, the financial impact of any single contract deferral will progressively diminish in the

context of a growing base of revenue and profitability. Visibility will also improve over time as a function of more multi-year term licences and usage-based revenue within the overall mix.

The margin benefit of Artificial Solutions migrating away from delivering services has already been emphatic, with further upside anticipated, as reflected in management guidance of a gross margin in excess of 70% by 2020. We will return to this aspect later in this report. The inevitable shorter-term impact, pending an uplift in usage revenue, has been a flatter revenue profile, due to services revenue playing a diminishing role in the revenue mix.

# Financials

## Revenue

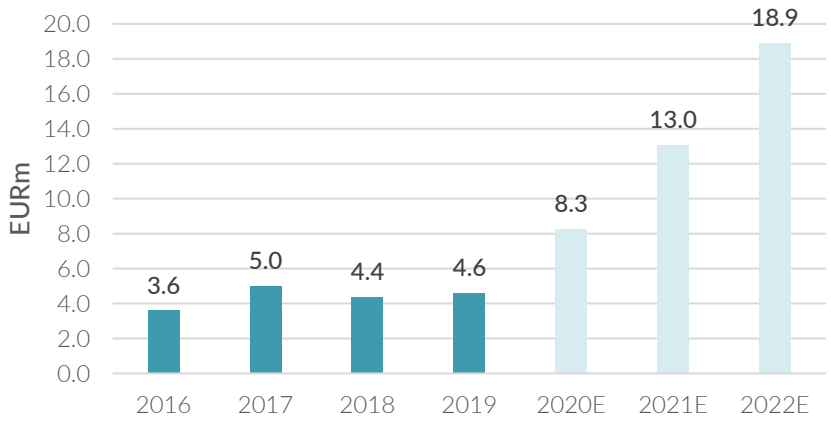
*Artificial Solutions' revenue model is inherently scalable*

The enterprise-grade nature of the company's conversational AI capabilities allows the company to focus its attention on the largest enterprises with the highest numbers of users. The other side of the coin is that sales cycles are typically fairly extended, and usually require pilot deployments in some form. However, once these enterprises have accepted that Artificial Solutions delivers on their requirements, the opportunity to scale revenue is substantial.

Artificial Solutions' revenue model is inherently scalable, with multi-year term licences and compulsory support agreements that will, over time, serve to create high levels of revenue visibility. New customers will typically engage in a pilot deployment in some form. Once the pilot or proof-of-concept has fulfilled the customers' requirements, it will be migrated to a full production licence, which will trigger the payment of full licence fees and support contracts.

There are indications that pipeline customers are exhibiting a willingness to bypass pilot deployments in favour of moving directly to full deployments. During FY'19, some new customers that were added opted to move directly to a production licence. While the growing base of reference customers and successful case studies should support this trend, together with specific product launches designed to facilitate partner deployment of Teneo solutions, we are not making any assumptions in this regard or assuming that sales cycles will contract. Indeed, the current global uncertainties lead us to retain a conservative stance on overall revenue growth.

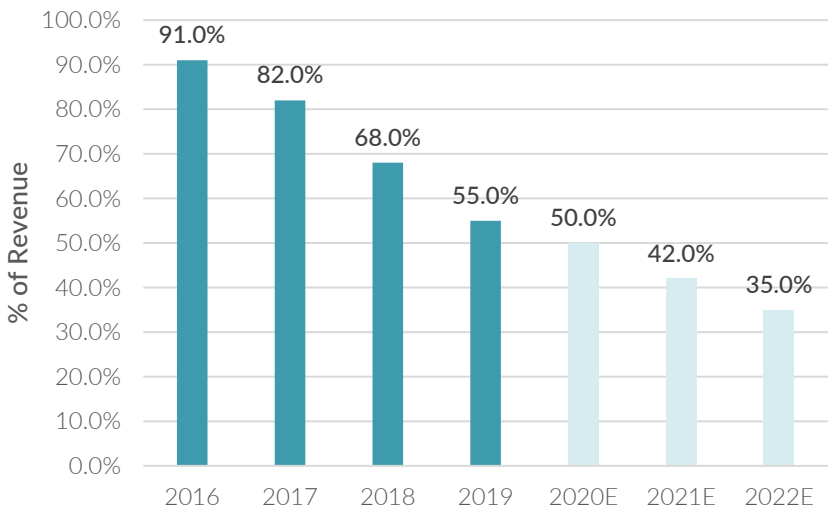
**Artificial Solutions – net sales estimates (€m)**




*Source: Company data, Hardman & Co Research*

Artificial Solutions sells term licences that grant an enterprise the right to use its Teneo platform for a specified period – usually two or three years. Alongside the term licences, and associated support and maintenance contracts, each customer contract incorporates a usage-based revenue element. The nature of customer agreements varies in that some will contract for usage upfront, while other customers will only commit to licence revenue at the outset and pay usage-based fees as incurred. As such, the future revenue to come from existing customers is beyond that included in order backlog.

Artificial Solutions – % of revenue from direct sales

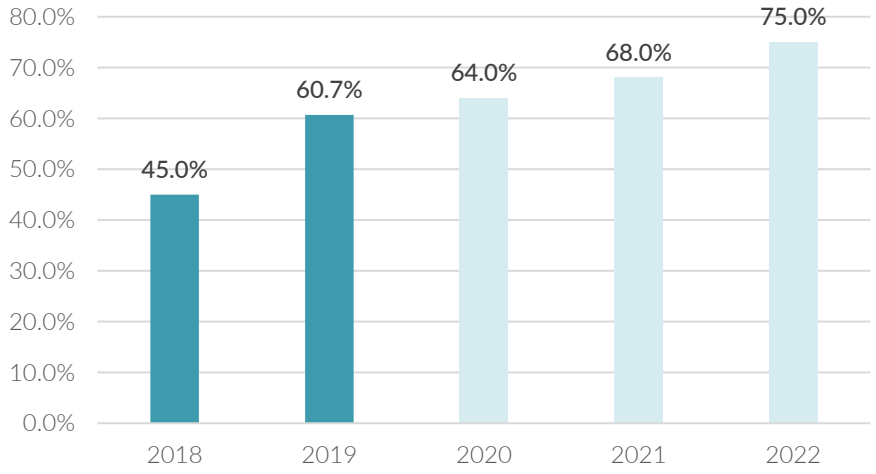



*Source: Company data, Hardman & Co Research*

*We have incorporated significant margin increases into our forecasts*

There has been a material uplift in the gross margin over the past two years, reflecting the growing licence component within revenue and the reduction in professional services activity due to more systems integrator involvement. The chart below reflects the significant gross margin increases that we have incorporated into our forecast revisions, driven by the anticipated continuation of the transition away from consultancy/professional services revenue towards platform licence sales.

Artificial Solutions – gross margin estimates (%)




*Source: Company data, Hardman & Co Research*

# Revenue model

*Revenue growth expected to trend at least in line with NLP end-market*

Over time, there should be the progressive growing importance within the revenue mix of usage revenue, which is driven by a combination of new production licences with upfront commitments to usage bundles and user growth/higher transaction volumes running through existing customer enterprise applications built on Teneo. As a consequence of these drivers, Artificial Solutions' revenue growth over the next few years is expected to trend at least in line with the NLP end-market. The latter is expected to grow at ca.35%-40% p.a. over the next five years.

**Artificial Solutions – revenue model**

| Year-end Dec (€m) | 2017 | 2018 | 2019 | 2020E | 2021E | 2022E |
|---|---|---|---|---|---|---|
| **Licences** | **1.60** | **1.60** | **2.32** | **2.89** | **4.18** | **4.73** |
| % growth YoY | 45% | 0% | 45% | 25% | 44% | 13% |
| % of total revenue | 32% | 36% | 50% | 35% | 32% | 25% |
| **Usage** | **0.60** | **0.50** | **0.73** | **3.39** | **7.05** | **12.30** |
| % growth YoY | 200% | -17% | 45% | 366% | 108% | 75% |
| % of total revenue | 12% | 11% | 16% | 41% | 54% | 65% |
| **Services** | **2.80** | **2.29** | **1.57** | **1.98** | **1.83** | **1.89** |
| % growth YoY | 22% | -18% | -31% | 26% | -8% | 4% |
| % of total revenue | 56% | 52% | 34% | 24% | 14% | 10% |
| **Net sales** | **5.00** | **4.39** | **4.62** | **8.26** | **13.05** | **18.92** |
| % growth YoY | 39% | -12% | 5% | 79% | 58% | 45% |
| **Capitalised costs** | **0.87** | **1.19** | **1.13** | **1.20** | **1.27** | **1.30** |
| % growth YoY | 37% | 36% | -5% | 6% | 6% | 2% |
| **Other operating income** | **1.23** | **0.52** | **0.69** | **0.90** | **1.16** | **1.28** |
| % growth YoY | 37% | -58% | 33% | 30% | 30% | 10% |
| **Total income** | **7.11** | **6.09** | **6.44** | **10.35** | **15.48** | **21.50** |
| % growth YoY | 38% | -14% | 6% | 61% | 50% | 39% |

*Source: Company data, Hardman & Co Research*

There are a number of primary elements to the Artificial Solutions revenue model:

- **Licence fees:** Artificial Solutions charges enterprises a licence fee to use its platform. These platform licence fees are term licences, typically spanning two to three years. The customer must have an active licence in order to continue using the Teneo platform. It is feasible that these contract periods will be extended, as the applications built on Teneo become more entrenched into their customers' IT environments and deliver significant returns on investment.
- **Support fees:** In addition, there is an annual support and maintenance fee of 17% of the upfront licence fee. This is in line with standard software industry practice, and covers minor platform updates, bug fixes and the provision of technical support, although much of the latter will be delivered by systems integrator partners. The annual support and maintenance is compulsory, alongside the annual term licence fee, in order for the customer to continue to use the product. Licences and support are grouped together for reporting purposes.
- **Usage fees:** Today, usage fees represent a modest part of the revenue base, reflecting the relatively early stage of many of the customer deployments. However, as we have discussed extensively in this report, usage revenue growth is accelerating and is expected to grow substantially, as end-user interactions on the applications that have been built on Teneo scale in number. For example, a number of Artificial Solutions' major customers pay usage fees per successful transaction or per active user per month.

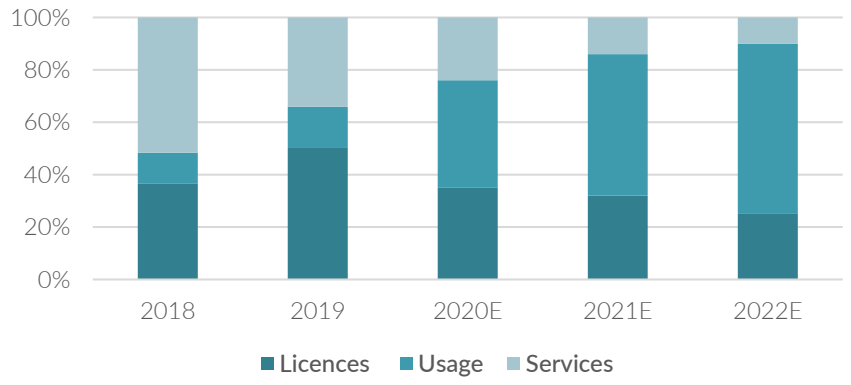
- **Professional and hosting services:** Artificial Solutions continues to maintain a professional services capability, but has sought to reduce services revenues in recent years, in favour of leaving implementation and integration services to systems integrator partners. Similarly, in terms of application delivery, new customer deployments tend to be on-premise, or the hosting services are provided by systems integrator partners.

The revenue mix has been trending towards licences over the past three years. As we have noted, since completing the initial development of the core Teneo platform in 2013, the company has focused on reducing its proportion of services revenue through engaging with partners to sell and implement its Teneo platform. The benefits to Artificial Solutions of this shift have included significantly enhanced margins and improved revenue scalability.

*Revenue mix, going forward, expected to shift in favour of usage revenue*

Going forward, the revenue mix is expected to shift significantly in favour of usage revenue, as discussed earlier in this report. As noted, for FY'22, we are forecasting 65% of total reported revenue from usage (i.e. transactions processed through the customer applications built on Teneo). This compares with 12% of total revenue comprising usage fees in 2017. It is noteworthy that our 65% forecast for usage revenue is lower than the 80% metric cited by Artificial Solutions, but we also note that this guidance refers to 80% by the end of 2022, implying a 4Q'20 run rate, rather than 80% for FY'20.

**Artificial Solutions – evolving revenue mix (%)**




*Source: Company data, Hardman & Co Research*

Below the net sales lines, there are two additional components of total revenue, which are other operating income, representing R&D credits (which we conservatively assume will be lower going forward, against a backdrop of growing R&D expenditure), and capitalised costs (which are treated as income under local accounting rules for the purpose of Artificial Solutions' statutory reporting). We focus on net sales as the appropriate barometer of the company's underlying top-line performance.

## Operating expenses

*Operating cost base not expected to see significant increases going forward*

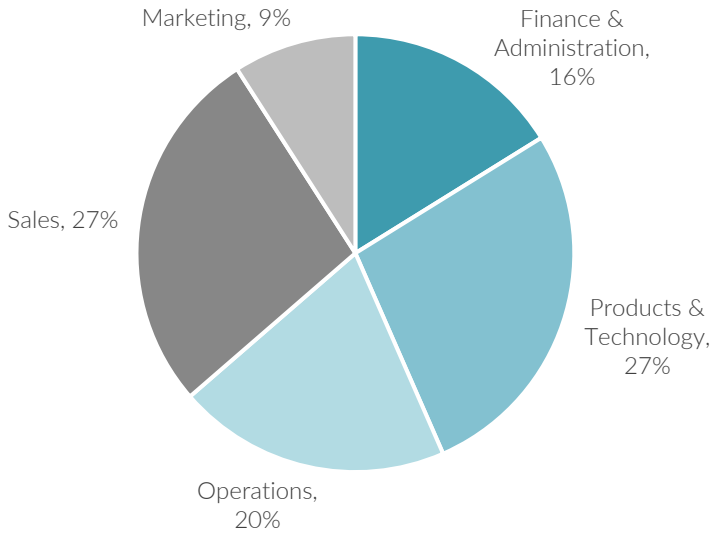
Overall headcount stood at 113 employees at the end of 2019, an increase of nine full-time employees versus the prior year. Looking forward, it is not expected that the operating cost base will see significant increases. Within total headcount, there has been a marked transition away from services-centric people to greater pre-sales, sales and marketing heads.

Personnel costs were up 11% YoY in FY'19, primarily reflecting the cost of annual salary increases, of shifting the mix of heads and the hiring of new employees in the US and Asia-Pacific. Management does not anticipate a need to scale up headcount from here.

Total operating expenses for the full year increased to SEK 214.5m from SEK 181.2m, while adjusted operating expenses increased to SEK 186.0m from SEK 181.2m.

R&D will remain a focus to support the company's technology-centric competitive advantages versus vendors of more mainstream offerings. However, additional heads in this area are not required. Headcount increases are expected to be in IT, pre-sales, sales and partner alliance capabilities, but will be undertaken in a measured and modest fashion to ensure strong productivity.

**Artificial Solutions – operating expenses split, 2019**




*Source: Company data, Hardman & Co Research*

- Cashflow from operating activities was an outflow of €2.6m in FY'19, reflecting an increase in net finance costs, partially offset by improved collections. Operating cashflow breakeven is expected in 4Q'20. Our cashflow figures include the 1Q'20 receipt of the ca.€10.5m raised in the equity placing that took place in June 2019.
- Payment terms are not coming under pressure, with all customers within a range of 30 to 60 days, and this is not being affected by partner sales. Management notes that it will keep an eye on the working capital trend, as usage sales through partners increase as a proportion of the revenue mix.

# Debt and financing

*Our estimates assume that a refinancing will take place in FY'20*

Post completion of the reverse takeover transaction in March 2019, Artificial Solutions had €17.3m of interest-bearing liabilities, the majority comprising debt that is due for repayment during 2020. Our expectation is that these debt arrangements and facilities will be refinanced during the course of 2020 on improved terms, reflecting the financial performance of the business.

Artificial Solutions remains loss-making and hence has working capital requirements to fund losses prior to achieving cashflow breakeven, which the company hopes to achieve in 4Q'20. In February 2020, Artificial Solutions completed the raise of gross proceeds of SEK 120.5m (ca.€11.0m), which was the target (excluding over-allotment options) of the fundraising that was launched in December 2019. The resulting increase in the share count was 18,532,998 to 43,243,663.

The previous equity fundraising was completed in July 2019, raising gross proceeds of SEK 65.7m (€6.1m) through the issue of 2.74m new shares at a price of €24.0.

At the end of FY'19, the company had total liabilities to third-party lenders of €16.0m. This is stated prior to the completion of the SEK 120.5m gross proceeds raised in the recent rights issue. Our estimates assume that a refinancing will take place in FY'20, and it is our understanding that the company's discussions in this regard are ongoing.

**Artificial Solutions – debt profile as at end-March 2020**

| €m | Principal | Repayment fee & interest | Total repayment |
|---|---|---|---|
| Leman loans | 8.22 | 1.09 | 9.31 |
| Loan undertaking | 0.35 | 0.22 | 0.57 |
| Bridge loans | 1.00 | 0.27 | 1.27 |
| **Total venture debt** | **9.57** | **1.58** | **11.14** |
| Total bond Maranelle | 0.18 | 0.00 | 0.18 |
| Total bond NCP | 4.56 | 0.12 | 4.68 |
| Almi loans | 0.03 | 0.00 | 0.03 |
| **Total debt** | **14.33** | **1.70** | **16.03** |

*Source: Company data, Hardman & Co Research*

# Profit and loss

| Artificial Solutions – profit and loss account | | | | | | |
|---|---|---|---|---|---|---|
| Year-end Dec (€m) | 2017 | 2018 | 2019 | 2020E | 2021E | 2022E |
| **Income** | | | | | | |
| Net sales | 4.95 | 4.39 | 4.62 | 8.26 | 13.05 | 18.92 |
| Capitalised costs | 0.87 | 1.19 | 1.13 | 1.20 | 1.27 | 1.30 |
| Other operating income | 1.23 | 0.52 | 0.69 | 0.90 | 1.16 | 1.28 |
| **Total income** | **7.06** | **6.09** | **6.44** | **10.35** | **15.48** | **21.50** |
| | | | | | | |
| **Operating expenses** | | | | | | |
| Other external costs | -4.28 | -5.02 | -5.92 | -3.62 | -3.41 | -3.23 |
| Personnel costs | -9.57 | -10.33 | -11.11 | -10.97 | -10.84 | -12.90 |
| Other operating expenses | 0.00 | 0.00 | -2.11 | -1.06 | -0.95 | -0.86 |
| **Total operating expenses** | **-13.85** | **-15.35** | **-19.14** | **-15.65** | **-15.20** | **-16.98** |
| | | | | | | |
| **EBITDA (reported)** | **-6.79** | **-9.26** | **-12.71** | **-5.30** | **0.29** | **4.52** |
| Adj. EBITDA, excl. capitalised costs | -7.67 | -10.45 | -13.84 | -6.50 | -0.99 | 3.22 |
| Depreciation & amortisation | -2.64 | -2.24 | -1.09 | -1.20 | -1.32 | -1.46 |
| **EBIT (reported)** | **-9.44** | **-11.50** | **-13.80** | **-6.50** | **-1.04** | **3.06** |
| Adj. EBIT, excl. capitalised costs | -10.31 | -12.69 | -14.93 | -7.70 | -2.31 | 1.76 |
| | | | | | | |
| Net financial income | -1.49 | -1.44 | -3.34 | -3.01 | -2.71 | -2.44 |
| | | | | | | |
| **Pre-tax profit** | **-10.93** | **-12.94** | **-17.14** | **-9.51** | **-3.74** | **0.63** |
| Adj. PTP, excl. capitalised costs | -11.80 | -14.13 | -18.27 | -10.71 | -5.02 | -0.68 |
| Taxation | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Net income** | **-10.93** | **-12.94** | **-17.14** | **-9.51** | **-3.74** | **0.63** |

*Source: Company data, Hardman & Co Research*

# Balance sheet

| Artificial Solutions – balance sheet | | | | | |
|---|---|---|---|---|---|
| @ 31 Dec (€m) | 2018 | 2019 | 2020E | 2021E | 2022E |
| ASSETS | | | | | |
| Fixed intangible assets | | | | | |
| Capitalised expend. for licences & software | 2.87 | 2.99 | 3.11 | 3.19 | 3.18 |
| Goodwill | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total intangible assets | 2.87 | 2.99 | 3.11 | 3.19 | 3.18 |
| | | | | | |
| Fixed tangible assets | | | | | |
| Equipment, furniture & fittings | 0.17 | 0.17 | 0.20 | 0.27 | 0.38 |
| Total tangible fixed assets | 0.17 | 0.17 | 0.20 | 0.27 | 0.38 |
| | | | | | |
| Total fixed assets | 3.04 | 3.16 | 3.31 | 3.45 | 3.55 |
| | | | | | |
| Other non-current receivables | 0.54 | 0.51 | 0.51 | 0.51 | 0.51 |
| Total non-current assets | 3.58 | 3.67 | 3.82 | 3.96 | 4.06 |
| | | | | | |
| Current assets | | | | | |
| Accounts receivable – trade | 0.56 | 0.95 | 1.14 | 1.37 | 1.64 |
| Tax receivable | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Other receivables | 0.33 | 0.30 | 0.33 | 0.36 | 0.39 |
| Prepaid expenses & accrued income | 0.47 | 0.87 | 1.04 | 1.25 | 1.50 |
| Total current receivables | 2.24 | 3.00 | 3.39 | 3.86 | 4.42 |
| | | | | | |
| Cash & bank balances | 4.56 | 0.42 | 2.94 | 2.00 | 4.39 |
| Total current assets | 6.80 | 3.41 | 6.34 | 5.86 | 8.81 |
| | | | | | |
| TOTAL ASSETS | 10.39 | 7.08 | 10.15 | 9.82 | 12.87 |
| | | | | | |
| EQUITY & LIABILITIES | | | | | |
| Equity | | | | | |
| Share capital | 3.65 | 4.20 | 6.00 | 6.00 | 6.00 |
| Share premium reserve | 75.57 | 104.07 | 112.57 | 112.57 | 112.57 |
| Other equity, including result for year | -87.64 | -126.22 | -135.73 | -139.47 | -138.85 |
| Total equity | -8.43 | -17.95 | -17.16 | -20.90 | -20.28 |
| | | | | | |
| Long-term liabilities | | | | | |
| Liabilities to other lenders | 5.10 | 0.17 | 0.00 | 0.00 | 0.00 |
| Total long-term liabilities | 5.10 | 0.17 | 0.00 | 0.00 | 0.00 |
| | | | | | |
| Current liabilities | | | | | |
| Liabilities to other lenders | 9.13 | 20.86 | 20.86 | 20.86 | 20.86 |
| Accounts payable – trade | 0.36 | 0.93 | 1.67 | 2.64 | 3.83 |
| Other liabilities | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| Accrued expenses & deferred income | 3.87 | 3.09 | 4.64 | 6.96 | 8.01 |
| Total current liabilities | 13.71 | 24.89 | 27.31 | 30.72 | 33.15 |
| | | | | | |
| TOTAL EQUITY & LIABILITIES | 10.39 | 7.10 | 10.15 | 9.82 | 12.87 |

*Source: Company data, Hardman & Co Research*

# Cashflow

| Artificial Solutions – cashflow statement | | | | | |
|---|---|---|---|---|---|
| Year-end Dec (€m) | 2018 | 2019 | 2020E | 2021E | 2022E |
| Operating loss | -11.58 | -13.80 | -6.50 | -1.04 | 3.06 |
| Depreciation | 2.24 | 1.09 | 1.20 | 1.32 | 1.46 |
| Other items excluded from cashflow | 0.03 | 3.60 | 0.00 | 0.00 | 0.00 |
| **Adjusted operating loss** | **-9.31** | **-9.11** | **-5.30** | **0.29** | **4.52** |
| | | | | | |
| Net financial income | -1.44 | -3.34 | -3.01 | -2.71 | -2.44 |
| Taxation paid & received | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 |
| **Op. cashflow before working capital changes** | **-10.75** | **-12.15** | **-8.31** | **-2.42** | **2.08** |
| | | | | | |
| **Changes in working capital** | | | | | |
| (Increase)/decrease in receivables | -1.96 | -0.76 | -0.39 | -0.47 | -0.56 |
| Increase/(decrease) in liabilities | 0.82 | -0.55 | 2.28 | 3.29 | 2.23 |
| **Net change in working capital** | **-1.14** | **-1.31** | **1.89** | **2.82** | **1.67** |
| | | | | | |
| **Cashflow from operating activities** | **-11.89** | **-13.46** | **-6.42** | **0.40** | **3.75** |
| | | | | | |
| **Investing activities** | | | | | |
| Purchases of tangible fixed assets | -0.09 | 0.12 | 0.15 | 0.20 | 0.26 |
| Purchases of intangible fixed assets | -1.24 | -1.40 | -1.47 | -1.54 | -1.62 |
| Change in fixed assets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cashflow from investing activities** | **-1.33** | **-1.28** | **-1.32** | **-1.35** | **-1.36** |
| | | | | | |
| **Financing activities** | | | | | |
| Issue of new shares | 12.82 | 5.00 | 10.91 | 0.00 | 0.00 |
| Costs of new share issues | -0.35 | -0.93 | -0.60 | 0.00 | 0.00 |
| Issue of new non-registered shares | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Change in loans | 4.68 | 6.79 | -0.17 | 0.00 | 0.00 |
| **Cashflow from financing activities** | **17.15** | **10.86** | **10.14** | **0.00** | **0.00** |
| | | | | | |
| **Net change in cash & cash equivalents** | **3.93** | **-3.88** | **2.40** | **-0.95** | **2.39** |
| Cash & cash equivalents at start of year | 0.49 | 4.42 | 0.54 | 2.94 | 2.00 |
| **Cash & cash equivalents at end of year** | **4.42** | **0.54** | **2.94** | **2.00** | **4.39** |

*Source: Company data, Hardman & Co Research*

# Valuation

*DCF analysis produces implied fair enterprise value of €128m and equity implied fair value of €116m*

Our approach to understanding the potential valuation of Artificial Solutions centres on a DCF analysis. At the same time, we take account of a detailed valuation undertaken in 2016 of the company's intellectual property (IP) assets in the form of patents and software licences.

In summary, the DCF analysis produces an implied fair enterprise value of €128m and an equity implied fair value of €116m, while the most recent IP valuation analysis, undertaken in 2019, generated a patent valuation range of $125m to $153m. These valuation outcomes compare with the current enterprise value of ca.€34m (SEK 379m) and market capitalisation of ca.€22m (SEK 247m).

## DCF valuation

Based on our base assumptions, which are set out in their entirety in the table below, we derive an implied enterprise value for the company of €128m, which, after the current net debt position of ca.€12m, equates to an equity value of €116m. In Swedish Krona, the implied equity fair value is SEK 1,276m, which compares with the company's current market capitalisation on the NASDAQ First North Exchange in Stockholm of ca.SEK 247m.

### Artificial Solutions – Hardman & Co DCF analysis

| Key inputs | |
|---|---|
| Terminal FCF growth rate | 3.0% |
| Long-term sustainable EBIT margir | 35.0% |
| Long-term tax rate on EBIT | 20.0% |
| **WACC** | **10.0%** |

| Y/end December, €m | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | 2028E | Terminal value |
|---|---|---|---|---|---|---|---|---|---|---|
| **Revenues** | **10.4** | **15.5** | **21.5** | **28.0** | **35.5** | **44.4** | **53.2** | **59.6** | **62.6** | |
| *yoy growth* | *2.3%* | *49.6%* | *38.9%* | *30.0%* | *27.0%* | *25.0%* | *20.0%* | *12.0%* | *5.0%* | |
| EBIT margin | -62.8% | -6.7% | 14.2% | 7.5% | 12.8% | 18.0% | 23.5% | 29.0% | 35.0% | |
| **EBIT** | **-6.5** | **-1.0** | **3.1** | **2.1** | **4.5** | **8.0** | **12.5** | **17.3** | **21.9** | |
| Depreciation & amortisation | -1.2 | -1.3 | -1.5 | -1.5 | -1.6 | -1.7 | -1.8 | -1.9 | -2.0 | |
| **Adj. EBITDA** | **-7.7** | **-2.4** | **1.6** | **0.5** | **2.9** | **6.3** | **10.7** | **15.4** | **19.9** | |
| Tax rate | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 5.0% | 10.0% | 15.0% | 20.0% | |
| Tax on EBIT | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.4 | -1.3 | -2.6 | -4.4 | |
| Change in net working capital | 1.9 | 2.8 | 1.7 | 1.2 | 0.8 | 0.6 | 0.4 | 0.3 | 0.2 | |
| **Cashflow from operations** | **-5.8** | **0.5** | **3.3** | **1.7** | **3.7** | **6.4** | **9.8** | **13.1** | **15.7** | |
| Capex | -1.3 | -1.3 | -1.4 | -0.8 | -0.2 | 0.3 | 0.9 | 1.4 | 2.0 | |
| **Unlevered free cash flow** | **-7.1** | **-0.9** | **1.9** | **0.9** | **3.5** | **6.8** | **10.7** | **14.5** | **17.7** | **253.3** |
| Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Discount factor | 1.10 | 1.21 | 1.33 | 1.46 | 1.61 | 1.77 | 1.95 | 2.14 | 2.36 | 2.36 |
| **Present value** | **-6.5** | **-0.7** | **1.4** | **0.6** | **2.2** | **3.8** | **5.5** | **6.8** | **7.5** | **107.4** |

Note: based on medium-term assumptions from 2023E

| Implied valuation metrics | EURm |
|---|---|
| Sum of 9-year cash flow | 20.6 |
| Terminal value | 107.4 |
| Value of the firm | 128.0 |
| Net funds | -12.0 |
| **Total equity value** | **116.0** |
| No.of shares in issue (m) | 43.2 |
| **Fair value share price (EUR)** | **2.7** |
| €:SEK exchange rate | 11.0 |
| **Fair value share price (SEK)** | **29.5** |

*Source: Company data, Hardman & Co Research estimates*

## IP asset valuation

*Patent valuation range of $125m to $153m, derived by independent valuation specialist OxFirst*

The patent portfolio was revalued during 2019 by OxFirst, an independent valuation specialist. Artificial Solutions' patent portfolio consists of six patents, five of which have been granted, and one for which a patent application has been submitted and further approval is pending. All of these patents are relatively recent, with publication dates ranging between 2013 and 2018, and all are geographically limited to the United States.

The table below, sourced from OxFirst, provides further details of the six patents, and sets out details that are key to the evaluation of patents, including claims count and forward and reverse citations. OxFirst notes that the patents relate primarily to natural language interaction and natural language processing, forms of AI that allow humans to interact with computerised applications and electronic devices in free-format, natural language, using speech, text, touch or gesture.

**Artificial Solutions – patent portfolio**

| Patent Number | Published | Claims Count | Reverse Count | Forward Count | Keywords |
|---|---|---|---|---|---|
| US8346563B1[6] | 01/01/2013 | 3 | 6 | 133 | Natural Language, Virtual Assistant, Interaction |
| US20130268260A1<br>US8892419B2 | 10/10/2013<br>18/11/2014 | 2 | 5<br>6 | 76<br>21 | NL, VA, User Interface, Analytics Framework |
| US20140019116A1<br>US8903711B2 | 16/01/2014<br>12/02/2014 | 2 | 5<br>6 | 38<br>15 | NL, VA, User Interface, Analytics Framework |
| US20140244712A1<br>US9172747B2 | 28/08/2014<br>27/10/2015 | 6 | 5<br>5 | 54<br>5 | VA Network, VA brokers, connected-devices |
| US20150339376A1 | 26/11/2015 | 20 | 2 | 2 | NL Analytics, Data Analytics, Machine Learning |
| US20180089572A1<br>US10068174B2 | 29/03/2018<br>04/09/2018 | 20 | 0<br>5 | 0<br>1 | NL, Machine Learning, User-provided, Hybrid |

*Source: OxFirst*

Overall, the patent portfolio has 177 forward citations (when considering only the granted versions, where possible), 53 claims and 30 reverse citations. OxFirst ascribes considerable importance to the first patent, which was published in 2013 and is deemed to be the "core patent", as it is important to in excess of 100 patents from key vendors in the natural language processing and related segments. The core patent accounts for 133 of the total forward citations, of which seven are worldwide. Microsoft is the largest source of these citations, at 21. The second patent has been cited 27 times by Apple.

The valuation conclusions reached by OxFirst are set out in the table below. OxFirst reaches these using a combination of two approaches: net present value and a "top-down approach", the latter noted to be specific to patent valuation and a methodology that is stated to be used in legal matters relating to patents. Taking into account the value of the licensing opportunity and Artificial Solutions' software platform market opportunity, OxFirst derives a valuation range of $125m to $153m, which, at the mid-point, represents a 44% uplift vs. the valuation reached in 2016.

**OxFirst's 2019 patent valuation for Artificial Solutions**

| ($m) | Basis | Upper | Lower | 2016 valn. |
|---|---|---|---|---|
| Patents | Overall market opportunity | 100.6 | 77.3 | 56.4 |
| Software | Artificial Solutions market opportunity | 52.3 | 47.3 | 40.2 |
| **Total** | | **152.9** | **124.6** | **96.6** |

*Source: OxFirst, Hardman & Co Research*

# Disclaimer

*Hardman & Co provides professional independent research services and all information used in the publication of this report has been compiled from publicly available sources that are believed to be reliable. However, no guarantee, warranty or representation, express or implied, can be given by Hardman & Co as to the accuracy, adequacy or completeness of the information contained in this research and they are not responsible for any errors or omissions or results obtained from use of such information. Neither Hardman & Co, nor any affiliates, officers, directors or employees accept any liability or responsibility in respect of the information which is subject to change without notice and may only be correct at the stated date of their issue, except in the case of gross negligence, fraud or wilful misconduct. In no event will Hardman & Co, its affiliates or any such parties be liable to you for any direct, special, indirect, consequential, incidental damages or any other damages of any kind even if Hardman & Co has been advised of the possibility thereof.*

*This research has been prepared purely for information purposes, and nothing in this report should be construed as an offer, or the solicitation of an offer, to buy or sell any security, product, service or investment. The research reflects the objective views of the analyst(s) named on the front page and does not constitute investment advice. However, the companies or legal entities covered in this research may pay us a fixed fee in order for this research to be made available. A full list of companies or legal entities that have paid us for coverage within the past 12 months can be viewed at http://www.hardmanandco.com/legals/research-disclosures. Hardman may provide other investment banking services to the companies or legal entities mentioned in this report.*

*Hardman & Co has a personal dealing policy which restricts staff and consultants' dealing in shares, bonds or other related instruments of companies or legal entities which pay Hardman & Co for any services, including research. No Hardman & Co staff, consultants or officers are employed or engaged by the companies or legal entities covered by this document in any capacity other than through Hardman & Co.*

*Hardman & Co does not buy or sell shares, either for their own account or for other parties and neither do they undertake investment business. We may provide investment banking services to corporate clients. Hardman & Co does not make recommendations. Accordingly, they do not publish records of their past recommendations. Where a Fair Value price is given in a research note, such as a DCF or peer comparison, this is the theoretical result of a study of a range of possible outcomes, and not a forecast of a likely share price. Hardman & Co may publish further notes on these securities, companies and legal entities but has no scheduled commitment and may cease to follow these securities, companies and legal entities without notice.*

*The information provided in this document is not intended for distribution to, or use by, any person or entity in any jurisdiction or country where such distribution or use would be contrary to law or regulation or which would subject Hardman & Co or its affiliates to any registration requirement within such jurisdiction or country.*

*Some or all alternative investments may not be suitable for certain investors. Investments in small and mid-cap corporations and foreign entities are speculative and involve a high degree of risk. An investor could lose all or a substantial amount of his or her investment. Investments may be leveraged and performance may be volatile; they may have high fees and expenses that reduce returns. Securities or legal entities mentioned in this document may not be suitable or appropriate for all investors. Where this document refers to a particular tax treatment, the tax treatment will depend on each investor's particular circumstances and may be subject to future change. Each investor's particular needs, investment objectives and financial situation were not taken into account in the preparation of this document and the material contained herein. Each investor must make his or her own independent decisions and obtain their own independent advice regarding any information, projects, securities, tax treatment or financial instruments mentioned herein. The fact that Hardman & Co has made available through this document various information constitutes neither a recommendation to enter into a particular transaction nor a representation that any financial instrument is suitable or appropriate for you. Each investor should consider whether an investment strategy of the purchase or sale of any product or security is appropriate for them in the light of their investment needs, objectives and financial circumstances.*

*This document constitutes a 'financial promotion' for the purposes of section 21 Financial Services and Markets Act 2000 (United Kingdom) ('FSMA') and accordingly has been approved by Capital Markets Strategy Ltd which is authorised and regulated by the Financial Conduct Authority (FCA).*

*No part of this document may be reproduced, stored in a retrieval system or transmitted in any form or by any means, mechanical, photocopying, recording or otherwise, without prior permission from Hardman & Co. By accepting this document, the recipient agrees to be bound by the limitations set out in this notice. This notice shall be governed and construed in accordance with English law. Hardman Research Ltd, trading as Hardman & Co, is an appointed representative of Capital Markets Strategy Ltd and is authorised and regulated by the FCA under registration number 600843. Hardman Research Ltd is registered at Companies House with number 8256259.*

*(Disclaimer Version 8 – Effective from August 2018)*

# Status of Hardman & Co's research under MiFID II

*Some professional investors, who are subject to the new MiFID II rules from 3rd January, may be unclear about the status of Hardman & Co research and, specifically, whether it can be accepted without a commercial arrangement. Hardman & Co's research is paid for by the companies, legal entities and issuers about which we write and, as such, falls within the scope of 'minor non-monetary benefits', as defined in the Markets in Financial Instruments Directive II.*

*In particular, Article 12(3) of the Directive states: 'The following benefits shall qualify as acceptable minor non-monetary benefits only if they are: (b) 'written material from a third party that is commissioned and paid for by a corporate issuer or potential issuer to promote a new issuance by the company, or where the third party firm is contractually engaged and paid by the issuer to produce such material on an ongoing basis, provided that the relationship is clearly disclosed in the material and that the material is made available at the same time to any investment firms wishing to receive it or to the general public…'*

*The fact that Hardman & Co is commissioned to write the research is disclosed in the disclaimer, and the research is widely available.*

*The full detail is on page 26 of the full directive, which can be accessed here: http://ec.europa.eu/finance/docs/level-2-measures/mifid-delegated-regulation-2016-2031.pdf*

*In addition, it should be noted that MiFID II's main aim is to ensure transparency in the relationship between fund managers and brokers/suppliers, and eliminate what is termed 'inducement', whereby free research is provided to fund managers to encourage them to deal with the broker. Hardman & Co is not inducing the reader of our research to trade through us, since we do not deal in any security or legal entity.*

research@hardmanandco.com

35 New Broad Street
London
EC2M 1NH

+44(0)20 7194 7622

www.hardmanandco.com