

Expert System

Trading update

Investing in the international opportunity

Expert System's 2015 acquisition of TEMIS has put it in a strong position to leverage its award-winning cognitive technology across a much larger global footprint in the text analytics market (expected to reach \$6.5bn by 2020). It has extended its strategic partnerships, including becoming a Google Premier Technology Partner and developing its relationships with system integrators. Its impressive client base includes Eli Lilly, Thomson Reuters, UniCredit, Shell, and a number of national security agencies. Our base case DCF suggests a share valuation of €2.78, while recent fund-raising deals in the sector suggest the potential for a higher value.

Year end	Revenue (€m)	EBITDA* (€m)	EPS* (c)	DPS (c)	EV/EBITDA (x)	Yield (%)
12/14	13.0	2.3	0.1	0.0	18.5	N/A
12/15	18.9	1.2	(3.3)	0.0	48.6	N/A
12/16e	27.9	2.5	(1.8)	0.0	23.8	N/A
12/17e	32.5	4.9	3.6	0.0	11.9	N/A

Note: *EBITDA and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

Growing demand for smarter data analytics solutions

Ever increasing amounts of data are being produced, 80% of which is estimated to be unstructured. The need to derive useful insights from this growing body of data is driving the demand for cognitive computing and smarter data analytics solutions, including semantic search applications such as those offered by Expert System. Potential applications are wide ranging, including security and fraud detection, customer relationship management and brand protection, as well as competitive intelligence. Allied Market Research estimates that the global text analytics market could be worth as much as \$6.5bn by 2020 growing at a CAGR of 25.2% from 2014, with North America expected to be the largest regional market.

Expert System's increasingly global offering

A mixture of organic and acquisition-driven growth has transformed Expert System into a truly global company. The TEMIS acquisition has extended the number of languages Expert System supports to 14 including English, Chinese, Spanish and Arabic (four of the top five most spoken languages globally). Expert System's geographic footprint includes Europe, the US and the Middle East. Its US division has been reorganised into two companies designed to focus on distinct opportunities in the public and private sectors. Its newly strengthened strategic partnerships with Google, and with other vendors and systems integrators, should also enable Expert System to reach opportunities beyond its direct sales reach.

Valuation: Platform solution remains key

Expert System trades on a 2016e EV/EBITDA of 23.8x, falling to 11.9x in 2017e. This places it at a premium to traditional linguistic services companies, but in line with more tech-focused enterprise search businesses. Our DCF valuation of Expert System based on our base case estimates suggests a value per share of €2.78.

Software & comp services

30 June 2016

Price €1.84

Market cap €46m

€1.22/\$1.35/£

Net debt (€m) at 31 Dec 2015 12.4

Shares in issue 25.1m

Free float 61.7%

Code EXSY

Primary exchange AIM Italia

Secondary exchange N/A

Share price performance



%	1m	3m	12m
Abs	(15.3)	(12.1)	(18.9)
Rel (local)	(3.6)	(0.6)	11.5
52-week high/low		€2.3	€1.8

Business description

Expert System has developed and patented technology that extracts useful information from unstructured text using semantic-based techniques. It applies this technology to a number of verticals including enterprise search, customer experience management and big data analytics.

Next events

Interim results	September 2016
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Investment summary

Company description: Cognitive computing and text analytics

Expert System has developed proprietary and patented semantic software to extract meaning from text. It can extract entities, relationships, sentiment and categorise the subject matter. This enables it to address the significant commercial opportunities that are presently available for solutions that can draw insights from the 80% of data that are thought to be unstructured. It listed on AIM Italia in February 2014 and, in September 2015, completed the acquisition of French competitor TEMIS for a total consideration of €12m. The acquisition increased Expert System's total workforce to c 220 people worldwide and expanded its overseas sales from 17% to today's 58% with offices in the US, Canada, UK, Spain, Italy, France and Germany. From these offices it serves a large number of blue-chip clients including Bloomberg BNA, Chevron, Eli Lilly, the International Monetary Fund, Raytheon, Shell, USA Today and Vodafone.

Financials: Investing for future growth

2015 was a year of significant investment for Expert System as it completed the purchase of TEMIS, opened additional offices in the US and increased its R&D spending. As a result, the company moved from a post-tax profit of €89k in 2014 to a loss of €3.3m, although it remained profitable at the adjusted EBITDA level, which fell from €2.3m to €1.2m. We have adjusted our forecast to reflect the incremental near-term investment and allowed additional time for current initiatives to begin to bear fruit. As a result, we have reduced our 2016 revenue forecasts from €28.8m to €27.9m and reduced our 2016 forecast adjusted EBITDA from €4.3m to €2.5m. We have also introduced 2017 forecasts for the first time and expect adjusted EBITDA to double to €4.9m in 2017 as the company begins to benefit from the operational leverage resulting from its larger size.

Valuation: More data analytics than linguistic services

Expert System operates in a high growth industry and its geographic expansion serves to further strengthen its growth potential. It presently trades on a 2016e EV/EBITDA of 23.8x falling to 11.9x in 2017e. This places it at a premium to linguistic services peers, but towards the middle of the valuation range of more highly rated data analytic technology peers. Our DCF valuation suggests a value of €2.78 per share. These valuations also fail to reflect the value in Expert System's stake in the unconsolidated ADmantX business, which was valued at €10m in a 2015 funding round. Other private funding rounds in the enterprise search space also suggest that Expert System could be worth more to a strategic buyer looking to leverage its independently recognised technology capabilities.

Sensitivities

Competition: Expert System has a number of patents relating to its technology. However, there are a number of large companies offering solutions based on a variety of approaches. These rivals may produce solutions that are more effective than Expert System's. **Business model transition:** Expert System is transitioning from a perpetual licence model (with somewhat lumpy revenues) to a more SaaS subscription-based model. It may also have to adapt its business model to suit different geographic markets going forward. The level of profitability may be higher or lower than the company's legacy offerings. **R&D investment risk:** Expert System must invest in R&D to stay at the forefront of technology in its industry. There can be no guarantee that this investment will yield a satisfactory return. **Integration risk:** Expert System's acquisition of TEMIS is a material one and introduces typical post-deal integration risks including higher than expected restructuring costs, failure to realise the anticipated synergies and potential business culture frictions. **Exchange rate risk:** Expert System is an increasingly international business with costs and revenues in a number of currencies. As a result, the company is more exposed to fluctuating exchange rates. The company mitigates this risk by diversifying its cost base with offices based locally.

Cogito: One core technology, many applications

Expert System has developed proprietary patented cognitive technology, which can extract meaning from unstructured, text-based natural language. This technology is at the heart of its Cogito software solution, which is designed to “read and understand the way people do” by placing words in context. The technology is based on artificial intelligence algorithms, which can distinguish between the different components of a sentence (ie nouns, verbs, object and subject). The technology has a number of practical solutions, as true understanding of the text enables the efficient discovery and extraction of relevant components that can then be organised and tabled in a way which draws out insights that ultimately support data-backed decision making. Ultimately, for data to be analysed it must first be understood. Expert System’s technology allows vast quantities of unstructured text-based data to be understood at speed. The commercial possibilities are wide ranging as the technology can be applied to every industry in any instance that deals with data in text form.

Investment considerations

- **Significant market opportunity:** the market for data mining and analysis tools is growing strongly as the big data and artificial intelligence themes begin to deliver on their early promise. 89% of business leaders believe that big data will revolutionise business operations in the same way the internet did (source: Forbes, 2015). Wikibon projects that the market for big data will reach \$85bn by 2026, with a compound annual growth rate of 17% from 2011 to 2026.
- **Proprietary technology:** Expert System’s Cogito system is proprietary and backed by a number of patents. The quality Cogito technology has been validated by leading technology research companies, including Gartner and Forrester.
- **Strategic partnerships:** Expert Systems has developed an API, which means that its Cogito technology can be imbedded into other software applications and cloud services. It was recognised as a Google Premier Search Technology Partner in October 2015. It has also been expanding the number of relationships with established system integrators to expand its distribution reach.
- **Increasing number of demonstrable technology applications:** Expert System launched Cogito Risk Watcher in November 2015, a software solution for enterprise operational risk and compliance analysis. This is one of a number of vertical specific adaptations of its core technology. The company is offering more standardised solutions that can be rolled out across an industry at higher margins than had been possible historically with its more bespoke offerings.
- **International expansion:** Expert System is generating an increasing amount of its sales outside Italy. It is only at the start of this process, potentially creating a much greater growth runway for the company. The company now has 18 subsidiaries/offices and seven labs in six countries, up from five offices and three labs in early 2014. The company is evaluating further expansion opportunities in German speaking European countries.

Business overview

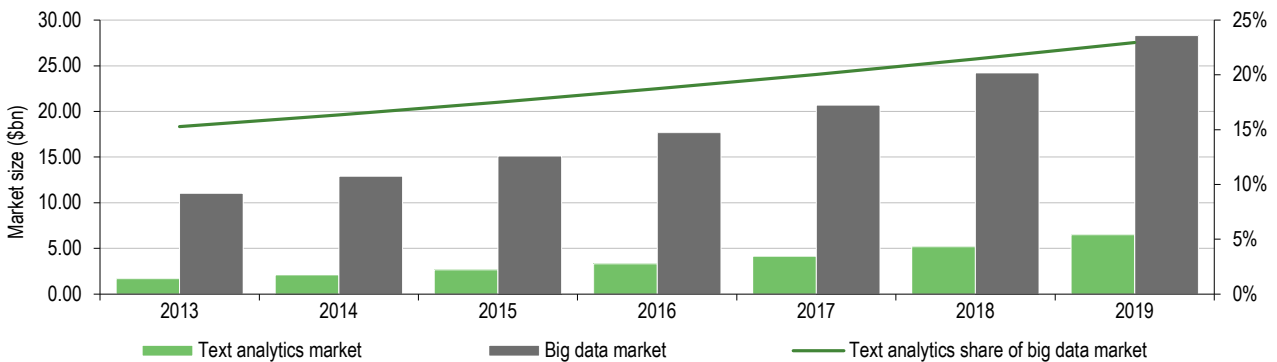
Expert System was formed in 1989 and its three founders, Stefano Spaggiari (CEO), Marco Varone (CTO) and Paolo Lombardi (R&D director) remain at the business to this day. The company aimed to bring technology to the field of linguistics, a discipline that at the time still consisted of extremely manual approaches. Expert System was successful in licensing its early technology to Microsoft for use in its Microsoft Word software programme. It developed its early work into one of the first semantic analysis platforms, which became the basis for its patented Cogito technology. Over time, Expert System’s Cogito technology has been expanded to incorporate more languages (presently 14) and to address specific language nuances in multiple disciplines and industry segments. Having achieved success and profitability in its home market of Italy, the company expanded overseas to

take advantage of a growing international need. In February 2014 Expert System raised over €12m in the largest AIM Italia IPO to that date. It has used the proceeds to further invest in R&D and to expand its international footprint, particularly in the US which, although highly competitive, is the world's largest market for semantic search applications.

Big data, knowledge management and text analytics

The amount of data being produced is growing exponentially, with unstructured data growing at an even faster rate. As a result, data sets have become too large and complex to be addressed by legacy data mining techniques. This has given rise to the specialism of knowledge management within the broader big data trend, with an explosion in the number of companies that seek to address the shortcomings of traditional approaches. Data analytics is just one strand of the knowledge management problem set. Other challenges include the capture, curation, search, sharing, storage, transfer, visualisation, querying updating and security of data. The inherent difficulty of natural language with its ambiguities and double meanings has historically created difficulties for those seeking to use computers to systematically search bodies of unstructured text. More recently, advances in cognitive computing have enabled products to be developed such as those offered by Expert System, which address these shortcomings. As a result, text analytics has become an increasingly large part of the big data market, as can be seen in Exhibit 1. Expert System's cognitive computing-based software helps to address the problems of search and curation through its ability to understand and categorise large data sets. This makes it much easier for analysts and decision makers to then extract meaning, patterns and insight hidden within unstructured textual data.

Exhibit 1: Global big data and text analytics markets



Source: Edison Investment Research, Allied Market Research, Wikibon

Semantic technology

Expert System's core Cogito technology is based on patented IP in the field of semantic technology. Semantic technology relates to the ability for software to derive meaning from data, usually passages of text but also extending to speech and other forms of unstructured data. Semantic technology is important because information in natural language form constitutes a significant portion of the world's unstructured data. Using linguistic analysis, semantic technology takes into account a language in its entirety – meanings, verb tense or mode, gender, etc and the contextual relationships between words, to mirror the way people process information.

Statistical or stochastic search approaches differ from the semantic approach in that they do not attempt to understand the meaning of text. Instead, they rely on the occurrence and distribution of keywords and they form the basis for popular search methods such as those used by Google, where its PageRank approach algorithms have been extremely successful. The statistical approach has the advantage of being quicker in building the repository of information and analysing a new block of text; however, its results fall short on relevance as it struggles with ambiguity or when

words have double meanings due to its inability to recognise context. We discuss the relative merits of Expert System’s semantic approach versus shallow text analytics and keyword-based technologies in our October 2014 [initiation report](#).

Competitive environment

Semantic enterprise search stands at the confluence of machine learning, natural language processing (NLP) and big data, all areas of the technology universe that are presently benefiting from increasing profile and rising investment. Technology and market research company Forrester estimates that there are over 200 vendors in the area of text mining and analytics alone. These range from niche companies with single function offerings, to companies with broader, more complete text analytics platforms. Forrester recognised Expert System as a ‘strong performer’ in its Q216 report, *The Forrester Wave: Big Data Text Analytics*, in which it ranks Expert System as one of only 10 companies, including IBM, HP Enterprises and SAS, which were recognised as leaders in the field. The primary selection criteria included a complete self-contained text mining and analytics platform; broad general-purpose text mining and analytics platform; and market presence as determined by revenues and interest from Forrester clients. This represents a significant third-party endorsement of the strength of Expert System’s product offering.

Expert System’s technology and product offering were also acknowledged by fellow global technology research company Gartner, which recognised it in the annual Gartner Magic Quadrant for Enterprise Search report. Both reports recognise the power of Expert System’s semantic offering, while also noting that it could benefit from further product extensions to complete its proposition.

Recent investments in cognitive computing & NLP

Technological advances in the area of cognitive computing/NLP have led to increasing investment in both technologies. IBM has staked a significant proportion of its future on the area of cognitive computing through its Watson super computer with an investment of over \$1bn to date. At the smaller end of the spectrum, a number of companies in the cognitive computing and NLP arena continue to receive increasing amounts of funding or are being bought out by larger players. Exhibit 2 shows a summary of some of the more noteworthy recent investments.

Exhibit 2: Announced investment and M&A activity in the area of natural language processing				
Company		Date	Investment/M&A	Value*
M&A target	Acquirer			
Semantria	Lexalytics	Jul-14	Lexalytics re-acquires Semantria to add a cloud offering to its previously on-premise solutions.	c \$10m
Blekkio	IBM	Mar-15	IBM acquires web search engine Blekkio to integrate into its Watson cognitive computing division.	unknown
AlchemyAPI	IBM	Mar-15	IBM acquires natural language processing and image analysis services company AlchemyAPI.	unknown
Engagor	Clarabridge	Mar-15	Clarabridge acquires social media management developer Engagor.	unknown
TEMIS	Expert System	Jun-15	Expert System agreed to buy rival semantic search company TEMIS of France, completed Sept 2015.	€12m
Funding activity				
Clarabridge	N/A	Apr-14	Clarabridge completes debt funding round, bringing total financing to \$103m.	\$6m
Medallia	N/A	Jul-15	Sequoia completes Series D funding into SaaS-based customer experience management company Medallia (\$255m total funding).	\$150m
Coveo	N/A	Nov-15	Series D funding bringing total financing to date to \$75m.	\$35m
Lucidworks	N/A	Nov-15	Series D funding bringing total financing to date to \$53m.	\$21m
Attivio	N/A	Mar-16	Series E funding round bringing total financing to \$102.1m.	\$31m
Persado	N/A	Apr-16	Series C funding round led by Goldman Sachs bringing total financing to \$66m.	\$30m
Digital Reasoning	N/A	May-16	Series D funding round brings total funding to \$74m. Investors include Goldman Sachs and Credit Suisse.	\$40m

Source: Edison Investment Research, Crunchbase.com. Note: *Funding rounds relate to total size of funding round, not company valuation.

Commercial solutions and growth strategy

Exhibit 3: Expert System's solutions offering

Solution	Description – functionality/applications
Search and information management	Makes it easier to find and identify relevant information by categorising and understanding content through semantic tools. It allows users to search by concept rather than keyword, and find closely related information. Expert System's tools are compatible with Microsoft SharePoint and other major document and content management platforms.
Text analytics	Analyses text and extracts entities, concepts and the relationship between them. Relationship extraction is one of the key benefits of this technology because it can be used to quickly and easily identify relationships between people and organisations.
Intelligence and security	Analyses publicly available information (ie websites) to alert the customer to key news and information related to its business. The Cogito software can analyse thousands of sources in real time and extract useful and relevant information. In theory, this should significantly reduce the effort required by the customer to find and interpret relevant newsflow.
Automatic categorisation	Content is automatically categorised using the semantic network to determine the classification of content within a document. This helps improve navigation and searchability without having to manually categorise content. Expert System has a number of media clients that use this technology to automatically categorise news content and add metadata to articles to improve search engine search relevance.
Taxonomy and ontology management	When applied to websites, taxonomy relates to the way content within websites is classified. Ontology is the classification of concepts in a specific knowledge domain. Expert System's semantic tools can be used to build and maintain taxonomies and ontologies to allow efficient structuring of information.
Customer interaction management	Enables natural language interaction with customers. The specific implementation varies, for example IWBank uses Expert's semantic technology as the intelligence behind its online virtual assistant. Using semantic technology in this way helps to improve efficiency by helping the customer find the answer to their questions automatically, thereby reducing the number of calls that need to be managed by a call centre.
Social media monitoring	Monitors social media for comments about the company or brand to alert management if there is a brand-damaging (or enhancing) trend developing. The tool analyses social media in real time to alert management quickly with limited (if any) manual intervention. It can also be used to provide the company with more information on brand perception.
ADmantX	ADmantX is a separate subsidiary and was formed to apply the Cogito technology to online advertising. It uses sentiment analysis and categorising aspects of the Cogito tools to identify websites that are appropriate for advertising specific brands and products. The advertiser will use the ADmantX service to query whether the website it is targeting is appropriate for its product. Usage is charged on a per-query basis. ADmantX tools are available as an API via a SaaS model and as an app in ad platform AppNexus.

Source: Edison Investment Research, Expert System

Target industry verticals

Expert System's software can be applied to bodies of text across the spectrum of its 14 supported languages. However, the company has focused its efforts on a few particular industries to both demonstrate the power of the software in these industries and to maximise the value of industry-specific nuances, which it can develop into the technology and leverage across other industry players. Industry-specific knowledge can act as a competitive advantage, as Expert System's development engineers can programme industry specific jargon, phrases and word associations into the software to increase the relevance of results even further. Industries that have been of specific focus for Expert System include banking, insurance and finance, life sciences and pharma, oil & gas, as well as media & publishing. Expert System is also increasingly developing applications to address the growing opportunity in the national defence and security sector, with ongoing initiatives with major US federal agencies, law enforcement organisations, US Department of Defense, US Department of Justice, FBI and the Defense Threat Reduction Agency.

A global footprint to address a global opportunity

Expert System has spent much of the last year carrying out a number of acquisitions and restructuring some of its divisions to best take advantage of the global opportunity before it.

The September 2015 acquisition of France-headquartered TEMIS transformed Expert System from a largely Italy-focused entity into a company with the ability to be closer to its end-users across the world. This will help strengthen its ability to service its many multinational clients. It also extended the number of languages covered by Expert System to 14, including English, Spanish, Chinese and Arabic. Today, overseas revenues are c 60% of the total (17% before the acquisition), as can be seen in Exhibit 4.

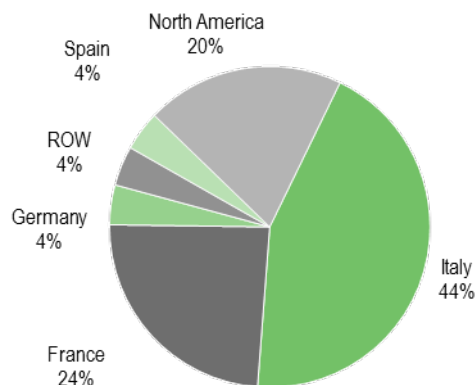
Europe: established Expert System Iberia (December 2014 acquired divisions of ISOCO, Spain). The company also announced the 100% acquisition of French text analytic solutions company TEMIS in June 2015 (completed in September 2015). TEMIS has offices in France (Paris and Grenoble) and Germany.

US: in October 2015 Expert System announced a reorganisation of its US operations designed to enable better focus on its two distinct target markets:

- The original Expert Systems US business will now concentrate on public sector-related opportunities in areas such as intelligence and defence. Although the company has already achieved some traction in this area, so far it has had to rely on security-cleared system integrators as intermediaries. Further success in this area has the potential to transform Expert System's revenue and profitability profile, as contracts can be significant in size and government agencies tend to be extremely loyal customers providing persistent business over a number of years. As a result of the scale of this opportunity, Expert System has made a significant investment in this area of the business including expanding its team of locally based US nationals. This is important if Expert System is to achieve the necessary security clearances to enable it to bid directly for contracts in the national security sector.
- TEMIS USA will be renamed Expert System Enterprise and will be the company's face when pursuing all private sector opportunities. The company's focus will continue to be in those areas where it has already had early success, including publishing, energy and financial services.
- Expert System expanded its US research capability with the establishment of two R&D labs in April 2016. These labs, located in Washington, DC and Silicon Valley, will ensure that Expert System is able to take advantage of local talent, while also ensuring that some of its development engineers are located close to its end-customers in what will be an increasingly important market for Expert System. We believe that both labs will conduct research pertaining to both private and governmental parts of the business.

RoW: in December 2014 Expert System established CY4Gate to address the growing 'cyber defence' market, where national security agencies are increasingly looking for intelligent methods to address emerging geopolitical risks. The company has also entered into a number of new business initiatives in South America and the Middle East.

Exhibit 4: 2015 geographic revenue split (pro forma)



Source: Edison Investment Research, Expert System

Strategic partnerships

Expert System has strengthened its routes to market by signing a number of strategic partnerships. These include: Google for Work (where it was named a Premier Search Technology Partner in October 2015), Google Cloud Platform, Cloudera, MongoDB, Onix, MarkLogic and several technology integrations including Alfresco and Salesforce. These are the most popular cloud and knowledge management providers on the market and will make it easier for system integrators to include Expert System's Cogito-based solutions as part of broader projects.

Expert System has also been working hard to further develop its relationships with all the major system integration players. This has included educating them on the ability of its Cogito technology to reconfigure data environments and enhance existing toolsets. This work will allow systems integrators and other technology providers to better help their customers to create new applications,

adding cognitive capabilities to their information solutions and platforms, providing Expert System with an extremely valuable third-party sales channel.

Reduction of ADmantX stake

ADmantX is a subsidiary of Expert System, which is focused on providing semantic solutions to the advertising market. Its purpose is to provide advertisers with software tools (on a SaaS basis) to automatically determine whether a website is appropriate to display an advert for its products. Expert System reduced its stake in ADmantX in September 2015 by choosing not to take part in the capital raise it was conducting. As a result, its stake fell from 69% to 60%. The pre-money valuation of ADmantX valued Expert System's stake at €10m. This represents a significant proportion of Expert System's enterprise value, which we believe is underappreciated by the market. The company has stated that ADmantX is no longer a part of its long-term strategic objectives as the online ad market has specific business characteristics that require in-depth industry expertise and dedicated resources. As a result, while we expect that Cogito to continue to sit at the heart of the ADmantX product offering, we believe that Expert System may continue to reduce its exposure over time.

Management

Expert System has an experienced and technology-focused management team, many of whom were the original founders. Stefano Spaggiari (CEO), Marco Varone (CTO and chairman) and Paolo Lombardi (R&D director) helped co-found Expert System and all have computer science degrees from the University of Modena. Stefano also holds an executive MBA from the Alma Graduate School of the University of Bologna. The management team also has experience in building start-ups; Marcello Pellacani (VP, Strategic Partnerships) and Andrea Melegari (SEVP, Defence, Intelligence and Security) founded web software developer ExpertWeb, which was sold to Italian internet services company Banzai. Luca Scagliarini (CMO) helped found and launch ADmantX in 2010 (within Expert System), where he previously served as CEO, and holds an engineering degree from the Politecnico di Milano, Italy, and an MBA from Santa Clara University, California. Claudio Palmolungo (EVP Europe) leads the European strategic business development. We believe this combination of skills and experience in the senior management team, along with the presence of a number of the original founders, is a strong positive.

Sensitivities

- **Competition:** there are many companies and researchers developing AI and NLP solutions. The best performing product is likely to vary depending on the specific application, but it is impossible to predict with a high degree of assurance what the leading technology will be. The impressive customer base that Expert System currently has in the security services, oil and gas and financial services fields, together with its endorsements by recognised technology researchers Forrester and Gartner, is a good indicator that it is currently one of the top performers in those fields, but this could change if peers release more competitive products.
- **Changing business model:** Expert System's business model and revenue structure is changing as it enters new markets and it is therefore very difficult to make financial forecasts with a great deal of accuracy. The investment case, however, is based on the potential of the technology and how well Expert System can adapt its commercial offering to take advantage of the opportunity in what continues to be a fast evolving market.
- **Lumpiness of revenue:** historically, most revenue has been generated from custom development work and therefore large projects have led to volatility in both revenues and profits. The proportion of revenue generated from these types of projects is expected to fall

over time as more revenue is generated from its standardised solutions, SaaS offering and third-party implemented APIs.

- **Reporting and regulation:** Expert System reports using Italian GAAP under AIM Italia regulations. It expects to move to reporting on an IFRS basis from next year (2016 results).
- **Foreign exchange:** with its expansion into the US and the UK, Expert System has become more exposed to fluctuating exchange rates. At the moment, Italy continues to be its largest market, somewhat limiting the impact, but as the US business grows it will become more significant. It will be partially offset by US-based expenses so the sensitivity may be largely a translational risk rather than operational.
- **Integration risk:** the 2015 TEMIS acquisition was transformational for Expert System, giving it access to a number of new markets. As with any acquisition there are a number of challenges that must be overcome when bringing the companies together including technology and systems integration, ensuring limited disruption to levels of customer delivery, as well as potential organisational and cultural flash points.

Valuation

Peer analysis

No established peer group of publicly listed pure enterprise search companies exists. Many of Expert System's closest competitors are either privately held or form divisions within much larger multi-disciplinary technology companies. We have produced a list of peers that incorporates language services businesses, global enterprise search peers and smaller Italian software peers.

Exhibit 5: Peer group comparables

Company	Reporting CCY	Share price (local)	Market cap (local m)	Current EV/Sales (x)	Next EV/Sales (x)	Current EV/EBITDA (x)	Next EV/EBITDA (x)	Current P/E (x)	Next P/E (x)
Expert System	EUR	1.84	46.1	2.3	1.9	23.8	11.9	N/A	51.1
Int. listed language, data and analytics companies									
Nuance Communications Inc	USD	16.2	4531.7	3.1	3.0	9.5	9.7	10.6	9.7
SLI Systems	NZD	0.9	53.5	1.3	1.1	N/A	151.8	N/A	N/A
Splunk Inc	USD	58.9	7824.0	7.6	5.9	90.5	59.1	209.5	119.4
Teradata	USD	28.2	3664.7	1.6	1.6	6.1	6.3	11.7	11.6
PRGX Global	USD	5.2	114.8	0.7	0.7	5.6	5.0	30.8	21.0
Open Text Corp	USD	60.3	7314.3	4.5	4.1	12.2	11.1	16.8	15.1
CommVault Systems	USD	45.1	1996.2	2.6	2.4	20.3	16.0	48.7	39.6
Average				3.1	2.7	24.0	37.0	54.7	36.1
Small Italian software peers									
TXT e-solutions SpA	EUR	7.2	94.2	1.2	1.1	11.4	9.8	17.7	15.1
NoemaLife SpA	EUR	7.4	61.8	1.1	1.0	5.7	5.0	33.6	20.5
Average				1.2	1.1	8.6	7.4	25.6	17.8

Source: Bloomberg. Note: Priced at 21 June 2016.

Expert System is investing heavily in its future growth, and as a result we believe that its present EBITDA level understates the company's future steady state earnings power. Taking 2017e EBITDA as our base, it trades on an EV/EBITDA of 11.9x. This places it at a premium to language service peer Nuance Communications. SLI Systems is trading on a recovery valuation, although Expert System trades at a premium to SLI on an EV/Sales basis. We believe that Expert rightly trades at a premium to language service companies due its higher growth potential and the larger technological component of its business, particularly when compared to SLI Systems. When compared to its enterprise data peers, Expert System's valuation sits in the middle of the pack. We believe its valuation reflects the proprietary nature of Expert System's core Cogito technology and the significant ongoing investment in R&D, which we believe will enable it to take advantage of the high growth nature of the end-markets it is seeking to address. Expert System's valuation also fails to recognise the value in its non-consolidated stake in ADmantX, which was valued at €10m during ADmantX's 2015 fund-raising round, a significant proportion of Expert System's present EV and 40c of its present €1.84 share price.

DCF

We have also produced a DCF valuation analysis. Although we recognise that this is very sensitive to the inputs used, it can often better reflect the value in a business after it has successfully scaled up. Our DCF valuation is based on our best estimates (9% WACC, 25% long-term EBITDA margin, with revenue growing at a CAGR of 13% from 2015 to 2026 and capex/sales falling to 5% from 30% in 2015) and suggests a value per share of €2.78. A 1% decrease in the WACC would increase the valuation to €3.67, while a 1% increase would reduce the valuation to €2.15. Our long-term EBITDA margin is contingent on Expert System continuing to derive an increasing amount of its revenues from its SaaS-based standardised model.

Financials

2015 was a year of significant investment for Expert System as its management successfully internationalised the business to offer a broader platform from which to drive growth in the coming years. As a result, although the company continued to be profitable at the adjusted EBITDA level (€1.2m), it slipped to a net loss of €3.3m in 2015, from a profit of €89k in 2014. We have adjusted our 2016 forecasts to reflect the ongoing investments in marketing, people and product, and introduce 2017 forecasts for the first time. Details can be seen in Exhibit 6 below.

Exhibit 6: Changes to forecasts

€m	2015e	2015a	Difference (%)	2016e old	2016e new	Change (%)	y-o-y (%)	2017e new	y-o-y (%)
Revenues	19.0	18.9	(0.8)	28.8	27.9	(3.1)	47.9	32.5	16.7
EBITDA	1.3	1.2	(4.9)	4.3	2.5	(42.8)	103.9	4.9	99.5
EBITDA margin	6.7%	6.4%	(0.3)	14.9%	8.8%	(6.1)	2.4	15.1%	6.3
D&A	(2.1)	(2.2)	(4.1)	(2.4)	(2.3)	3.3		(2.6)	
Normalised operating profit	(0.9)	(1.0)	(17.0)	1.9	0.2	(91.9)	115.1	2.3	1374
Normalised operating margin	-4.6%	-5.5%	(0.8)	6.7%	0.6%	(6.1)	6.0	7.1%	6.5
Exceptionals	(0.7)	0.3	(137.3)	0	0			0	
Amortisation of acquired intangibles	0	(3.0)		0	(3.0)			(3.0)	
Reported operating profit	(1.6)	(3.8)	(139.7)	1.9	(2.8)	(284.4)	24.7	(0.7)	75.4
Net debt	7.7	12.4	61.4	7.7	17.8	131.2	43.0	20.6	16.1

Source: Edison Investment Research, Expert System

Cash flow

2015 was a year of significant investment for Expert System. Much of this relates to significant investment in capex, which was up 44% from €3.9m in 2014 to €5.6m in 2015, and the €3m upfront cash component of the €12m TEMIS acquisition. Operating cash flow was also negative in 2015 (-€2.2m), largely due to the investment in building its US footprint, including hiring staff and the opening of two new R&D facilities.

Balance sheet

Expert System increased its level of funding in 2015 to ensure that it was able to make the necessary investments in its future growth. This consisted of a mixture of convertible bonds, which increased from zero in 2014 to €5m in 2015 resulting from its fully subscribed July issue. The bond is long term in nature (9.5 years) and was issued at a very attractive interest rate of 4%. The company also increased its level of bank debt from €7.0m to €16.3m during the period, with a further €7.3m owed to other lenders. The net impact of the negative operating cash flow and the significant R&D and capital investments during 2015 resulted in Expert System moving from a net debt position of €2.8m to €12.4m at the end of 2015. However, it should be noted that the company retains the liquidity to meet its short-term financial obligations, with €11.2m of cash on the balance sheet. Expert System has also signalled that it intends to shore up its balance sheet and access further growth capital via a €5m equity raise to be completed later in the year (but not yet included in our forecast).

2016/17 outlook

We have slightly reduced our 2016 revenue forecast from €28.8m to €27.9m (48% y-o-y growth) to reflect a slightly longer sales cycle. Expert System has carried out a lot of work in recent months to introduce its upgraded product suite and APIs to system integrators. While they have received positive feedback, conversion to tangible sales activity is taking longer than we had previously accounted for. As a result, our adjusted 2016 EBITDA forecasts are down from €4.3m to €2.5m.

We have also introduced 2017 forecasts for the first time and expect revenues to grow by 17% versus our revised 2016 forecasts to €32.5m. We expect 2017 to be the year that much of Expert System's recent investments really begin to bear fruit. We particularly note the potential for contract wins in the US government division. Just one significant win in this area would lead to a material upgrade to our forecasts. However, given the inherent difficulty in forecasting the timing of any deal, we have taken a conservative approach and chosen not to model any win ahead of its announcement. We believe that our 2017 forecasts are achievable without a significant government contract win; with the company beginning to benefit from the operational leverage effects of increased size and a higher proportion of licensing revenues, we see its adjusted EBITDA rising to €4.9m with the EBITDA margin rising from 8.8% in 2016 to 15.1% in 2017.

Exhibit 7: Financial summary*

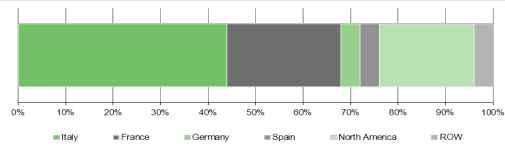
	€'000s	2012	2013	2014	2015	2016e	2017e
31-December		IT GAAP	IT GAAP	IT GAAP	IT GAAP	IT GAAP	IT GAAP
PROFIT & LOSS							
Revenue		11,593	11,109	13,045	18,853	27,884	32,534
EBITDA		2,624	2,014	2,339	1,204	2,456	4,901
Operating Profit (before amort. and except.)		1,765	916	609	(1,033)	156	2,301
Intangible Amortisation		0	0	0	(3,000)	(3,000)	(3,000)
Exceptionals		(319)	45	59	258	0	0
Other		0	0	0	0	0	0
Operating Profit		1,446	961	669	(3,775)	(2,844)	(699)
Net Interest		(298)	(376)	29	213	(904)	(907)
Profit Before Tax (norm)		1,467	539	638	(820)	(748)	1,394
Profit Before Tax (reported)		1,148	584	697	(3,562)	(3,748)	(1,606)
Tax		(452)	(359)	(609)	277	1,499	562
Profit After Tax (norm)		1,015	180	29	(756)	(449)	906
Profit After Tax (reported)		697	225	89	(3,284)	(2,249)	(1,044)
Average Number of Shares Outstanding (m)		22.0	22.0	22.0	22.8	25.1	25.1
EPS - normalised (c)		4.6	0.8	0.1	(3.3)	(1.8)	3.6
EPS - normalised and fully diluted (c)		4.6	0.8	0.1	(3.3)	(1.8)	3.6
EPS - (IFRS) (c)		3.2	1.0	0.4	(14.4)	(9.0)	(4.2)
Dividend per share (p)		0.0	0.0	0.0	0.0	0.0	0.0
Gross Margin (%)		100.0	100.0	100.0	100.0	100.0	100.0
EBITDA Margin (%)		22.6	18.1	17.9	6.4	8.8	15.1
Adj Operating Margin (%)		15.2	8.2	4.7	-5.5	0.6	7.1
BALANCE SHEET							
Fixed Assets		6,691	9,905	5,719	20,212	19,498	18,624
Intangible Assets		1,111	2,462	4,640	18,539	17,535	16,470
Tangible Assets		635	606	692	916	1,206	1,397
Investments		4,945	6,836	387	757	757	757
Current Assets		12,767	15,491	32,681	43,238	38,920	37,130
Stocks		722	476	1,563	1,797	1,797	1,797
Debtors		5,488	5,820	7,866	10,228	11,251	12,376
Cash		2,065	2,967	4,900	11,249	5,908	3,055
Other		4,492	6,228	18,352	19,964	19,964	19,902
Current Liabilities		(8,871)	(10,333)	(13,639)	(20,546)	(20,831)	(21,145)
Creditors		(6,538)	(7,350)	(10,698)	(15,111)	(15,396)	(15,710)
Short term borrowings		(2,332)	(2,984)	(2,940)	(5,435)	(5,435)	(5,435)
Long Term Liabilities		(4,642)	(5,172)	(7,803)	(22,185)	(22,185)	(22,185)
Long term borrowings		(4,642)	(5,172)	(4,799)	(18,240)	(18,240)	(18,240)
Other long term liabilities		0	0	(3,005)	(3,946)	(3,946)	(3,946)
Net Assets		5,945	9,890	16,958	20,718	15,401	12,423
CASH FLOW							
Operating Cash Flow		8,077	2,891	737	(2,230)	1,719	4,090
Net Interest		(298)	(376)	29	(107)	(904)	(907)
Tax		(452)	(359)	(609)	(278)	(300)	(500)
Capex		(3,095)	(2,384)	(3,905)	(5,646)	(5,296)	(5,536)
Acquisitions/disposals		0	0	(6,436)	(1,250)	0	0
Financing		0	0	12,341	257	0	0
Dividends		0	(180)	0	0	0	0
Net Cash Flow		4,232	(408)	2,156	(9,253)	(4,781)	(2,853)
Opening net debt/(cash)		6,352	4,909	4,822	2,839	12,426	17,767
HP finance leases initiated		0	0	0	0	0	0
Other		(2,788)	40	(173)	(335)	(560)	(0)
Closing net debt/(cash)		4,909	5,276	2,839	12,426	17,767	20,619

Source: Edison Investment Research, Expert System. Note: *Accounting will change to IFRS from 2016.

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Revenue by geography



Management team

Founder and CEO: Stefano Spaggiari

Stefano has been the CEO of Expert System for over 15 years. His guidance has led the company to achieve a leading position, receive prestigious international awards, and establish itself among the top ICT companies in the world in the field of information management. He founded this company with the idea to develop software to support other companies with the analysis of information. Recently, Stefano successfully managed Expert System's IPO and the company's internationalisation process. Stefano holds an EMBA from the Alma Graduate School of the University of Bologna, as well as a degree in Computer Science from the University of Modena, Italy.

Founder and CTO: Marco Varone

Marco, founder, president and CTO of Expert System, is one of the leading experts in semantic technology and NLP. He created the Cogito platform, which is the basis of all Expert System's products. He has worked in the field application of semantic technology in every advanced context: search engines, text analytics, natural language interfaces, Q & A systems, automatic categorisation and many others. He has led the company throughout its consistent growth and has helped it to achieve major successes across business sectors. He coordinates all activities of Research and Development and in his spare time, he writes about these issues on the company blog and his own blog, Semanticamente.

Executive Vice President Europe: Claudio Palmolungo

Claudio leads Expert System's strategic business development in Europe. Prior to joining Expert System, he was SVP, head of the International activities at Store Electronic Systems where he led the company's international expansion, creating direct and indirect sales channels and subsidiaries in Italy, Spain, Canada and the U.S. Claudio started his career at Magneti Marelli France, and at Accenture, where he managed pan-European projects in sales, sourcing and supply chain in a variety of sectors including automotive, retail, high tech and banking. He holds a degree in Business Administration from the University of Turin and from ESCP Europe, in Paris.

CEO, Expert System Enterprise: Daniel Mayer

Daniel is CEO of Expert System Enterprise (headquartered in the USA). He joined Expert System following its acquisition of TEMIS, where as VP of Product & Marketing, he shaped and promoted the award-winning Luxid® line of text analytics products. With 20 years of experience in marketing and product strategy throughout the IT value chain, Daniel's passion is in crossing the chasm by helping organisations leverage technologies that deliver significant business value. Daniel holds both a Masters degree in Business from HEC Paris and a Masters in Computer Science from Télécom ParisTech.

CEO, Expert System USA: Alan E. Calegari

Alan is the CEO of Expert System USA. Alan's distinguished career spans over 35 years where he has held executive roles with multinational corporations and boards in 13 countries and across a number of industries, including Security, Aerospace and Defence, Avionics and Rail Transportation. He leverages discipline gained throughout his executive career and his knowledge of world markets to respond to complex business challenges, driving growth initiatives, entering new markets and developing products and technologies. Alan earned a Ph.D. in Architecture from the University of Studies in Rome and the Loyola University Foreign Exchange Program. He continued his education at Harvard University in the Executive Education Program for Advanced International Business Management.

Principal shareholders

	(%)
Stefano Spaggiari	11.0
Paolo Lombardi	11.0
Marco Varone	11.0
Luxid Sarl	5.5
Other former TEMIS shareholders <5%	6.9

Companies named in this report

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