Green Quadrant: Enterprise Asset Management Software 2022

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This report provides a detailed fact-based comparison of the most prominent enterprise asset management (EAM) software vendors in the market today. Based on the proprietary Verdantix Green Quadrant methodology, our analysis encompassed two-hour live product demonstrations with pre-set scenarios, and vendor responses to a 207-point questionnaire covering 11 technical, 14 functional and nine market momentum categories. We also conducted interviews with 10 software users and reviewed the data from our global survey of 256 operational excellence decision-makers. Our analysis finds that the EAM software market is evolving through a slew of acquisitions and investments from private equity firms. This market activity has been driven by a new focus on cost savings, maintenance strategy digitization programmes, digital system amalgamation and sustainability. Spend on EAM software is set to grow, with providers looking to differentiate through increased mobile and wearable functionality, rapid implementations and analytics for predictive maintenance strategies.

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eMaint Focuses On IIoT Integrations And Workflow Configurability To Help Firms Maximize Asset Uptime
Hexagon Acquires Infor EAM To Offer A Market-Leading EAM Solution
IBM’s Revamped Maximo Application Suite Provides A Comprehensive Asset Management Solution Underpinned By Industry 4.0 Technologies
iOFFICE + SpaceIQ Offers ManagerPlus, A SaaS-Based EAM Solution, To Firms Managing Fleets Of Mobile Assets
Nuvolo Delivers A Highly Intuitive EAM Solution With Leading BI Capabilities to Healthcare And Real Estate Facilities
Pragma Offers Leading Asset Management Software With Strengths In Asset Information And Procurement Management
Ramco Provides A Comprehensive ERP Solution With EAM Capabilities To Heavy Asset Firms In APAC
SAP Leverages Innovative Technologies To Deliver A Solid Asset Management Software Suite
Ultimo Delivers A Highly Configurable EAM Solution For Mid-Market Firms In Europe
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ORGANIZATIONS MENTIONED

State Of The Market For EAM Software

Enterprise asset management (EAM) software is an outgrowth of computerized maintenance management systems (CMMS), which arose in the 1990s and 2000s as network connectivity became more reliable. The fundamental capabilities of a CMMS are the asset registry and resource and work order management functions. EAM software encompasses CMMS capabilities, but extends its value, looking to build a unified asset maintenance strategy within the wider business (see Figure 1). EAM software focuses on maintaining assets throughout their life cycle and is primarily deployed in heavy industry, in which the smooth running of assets is critical, for verticals such as manufacturing, oil and gas, power and water utilities and transportation. EAM software is also used in non-industrial verticals across commercial real estate, education, government and healthcare facilities.

The emergence of predictive maintenance analytics, mobile applications and, to a lesser extent, industrial wearables, has modified the EAM value proposition, allowing for more dynamic asset maintenance strategies via greater insights into asset condition and increased mobility to implement maintenance activities. In parallel, EAM software suppliers have added risk and worker safety management capabilities through acquisitions, partnerships and in-house product development, seeking to provide an end-to-end risk management and asset maintenance solution within a single platform. This report provides heads of maintenance and operations with a detailed assessment of 14 prominent vendors of EAM software. The study answers the following questions:

• What is the current state of the EAM software market?
• Which EAM software providers have the capabilities to meet my requirements?
• Which vendors have demonstrated success in my industry?
• How does my current EAM software compare with the best-in-class for my industry?
• How well-positioned is EAM to satisfy my evolving asset maintenance requirements?

To answer these questions, Verdantix assessed 14 suppliers using a 207-point questionnaire; defined six usage scenarios as the basis for two-hour live product demonstrations; interviewed 10 corporate users of EAM software; and surveyed 256 decision-makers responsible for operational excellence initiatives. Accruent, Brightly Software, DevonWay, Hexagon, iOFFICE + SpaceIQ, Nuvolo, Pragma, Ultimo and UpKeep participated actively in the study with complete responses to the questionnaire. eMaint provided a live product demonstration and briefing, but did not complete the questionnaire. Aptean, IBM, Ramco Systems and SAP were invited to participate, but either declined or did not respond. The analysis is based on the proprietary Verdantix Green Quadrant methodology, which provides a quantified, evidence-based and objective assessment of vendors of a comparable product or service.

Acquisitions And Funding Are Reshaping The EAM Software Market

The EAM market is long-established, emerging from the CMMS market as a more comprehensive and firm-wide solution for asset maintenance. Significant white space in the form of industries and regions with lower software penetration has made the EAM software market an attractive prospect to acquisitive firms and investors (see Figure 2). Market movements encompass:

• Acquisitions by incumbents and new players looking to expand capabilities and regional coverage. Alongside industrial software giants IBM, Oracle and SAP, the EAM market is populated with mid-sized firms, which have expanded capabilities and increased market share since 2018 through a series of acquisitions. These include Accruent’s 2018 purchase of Maintenance Connection, a CMMS vendor with 1,400 customers across government, healthcare, and heavy industry; the acquisition by iOFFICE (now
Figure 1

Mapping Capabilities For CMMS And EAM

<table>
<thead>
<tr>
<th>Generally associated with</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMMS</td>
</tr>
</tbody>
</table>

**Asset information management**: asset history, asset hierarchy & registry, criticality & risk ratings, spatial asset information

**Contractor management**: contractor information management, third-party work order management

**Customer management**: customer contracts, invoices & templates, reservation tracking

**Inspections & audits management**: checklist creation, documentation creation, event auditing, inspection planning & organization, severity assessments

**Inventory & materials management**: asset location tracking, product stewardship management, spare parts & inventory management

**Maintenance analytics**: asset failure prediction for predictive maintenance, asset lifecycle costing, condition monitoring

**Operational risk management**: hazardous materials management, incident management, lockout-tagout, management of change, permit to work

**Procurement management**: procurement document management, procurement planning & budgeting, purchase order management

**Resource planning**: asset depreciation, capital project management, service life, warranties & claims

**Work order and workforce management**: work order creation approvals, assignment, scheduling, completion & review, competency management, HR database, work hour tracking & visualizations

Source: Verdantix analysis
Note: * denotes partial functionality

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iOFFICE + SpaceIQ) of Hippo CMMS, a CMMS provider active in manufacturing verticals, in 2019; and Brightly's 2020 acquisitions of Australian asset investment planning (AIP) software supplier Assetic and UK-based EAM software supplier Confirm. The EAM software space has also attracted the attention of larger firms active in adjacent markets, as evidenced by Hexagon's $2.8 billion acquisition of Infor's EAM software business in 2021.

**Investments from private equity firms capitalizing on growth in the EAM software space.**
Investors have identified the EAM software market as a growth space. Brightly was acquired by Clearlake Capital, an investment firm, in 2019, while iOFFICE + SpaceIQ is majority-owned by Thoma Bravo. Insight Partners, a New York-based private equity firm, has significant investments in EAM software suppliers, leading investment rounds that led to $36 million in 2020 for UpKeep, a CMMS and EAM software supplier headquartered in Los Angeles, USA, and $31 million for Nuvolo, a US-based EAM software and integrated workplace management system (IWMS) software provider in 2021. San Francisco-headquartered
## EAM Software Market Transactions

<table>
<thead>
<tr>
<th>Year</th>
<th>Transaction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>June</td>
<td>Acquisition</td>
</tr>
<tr>
<td></td>
<td>July</td>
<td>Acquisition</td>
</tr>
<tr>
<td>2019</td>
<td>May</td>
<td>Investment</td>
</tr>
<tr>
<td></td>
<td>May</td>
<td>Acquisition</td>
</tr>
<tr>
<td></td>
<td>July</td>
<td>Investment</td>
</tr>
<tr>
<td></td>
<td>Nov</td>
<td>Acquisition</td>
</tr>
<tr>
<td></td>
<td>Oct</td>
<td>Acquisition</td>
</tr>
<tr>
<td>2020</td>
<td>March</td>
<td>Acquisition</td>
</tr>
<tr>
<td></td>
<td>May</td>
<td>Investment</td>
</tr>
<tr>
<td></td>
<td>Dec</td>
<td>Acquisition</td>
</tr>
<tr>
<td>2021</td>
<td>March</td>
<td>Investment</td>
</tr>
<tr>
<td></td>
<td>June</td>
<td>Investment</td>
</tr>
<tr>
<td></td>
<td>July</td>
<td>Acquisition</td>
</tr>
<tr>
<td></td>
<td>Sept</td>
<td>Investment</td>
</tr>
<tr>
<td></td>
<td>Oct</td>
<td>Acquisition</td>
</tr>
</tbody>
</table>

Source: Verdantix analysis  
Note: list not exhaustive; for full list contact Verdantix
MaintainX, a mobile-first maintenance and operations workflow provider, raised $39 million in Series B funding in 2021 led by Bessemer Venture Partners. Mid-sized EAM software providers are using funding to fuel their expansion into new regions and strengthen product capabilities.

**Growth In The EAM Software Market Is Driven By Digital Transformation Strategies, Worker Safety And Operational Excellence**

The EAM software market has evolved in the past five years as acquisitions, both by EAM software suppliers and new entrants, alongside investments from private equity, have ramped up. This market activity is down to the attractiveness of the space, with adoption of EAM software growing steadily. A variety of factors are driving this growth, such as:

- **Firms’ digital transformation strategies to formalize digital systems.**
  Digital transformation has been a key driver for increased spend on industrial software such as EAM, as part of an overarching operational excellence initiative. In the 2020 Verdantix global corporate survey, 94% of the 259 respondents stated that the availability of new digital technology would cause their firm to invest in operational excellence initiatives over the next two years (see Verdantix Global Corporate Survey 2020: Operational Excellence Budgets, Priorities & Tech Preferences; see Figure 3). In heavy industries, digital transformation has accelerated in recent years, primarily owing to COVID-19 and a renewed focus on sustainability priorities. Encore Wire, a manufacturer of copper and aluminium wire, installed Maintenance Connection from Accruent across its eight plants to replace its paper-based work processes.

  “Implementing EAM software transformed our organization. We can plan more easily and in a paperless environment sticking to schedules is simple. Over the past three years, we’ve achieved 99.7% facility reliability.” – IT and Administration Manager, Upstream Gas

- **Cost-cutting programmes to achieve financial KPIs.**
  Saving money on maintenance budgets is the primary goal for most maintenance managers. Seventy-one per cent of the 256 respondents in the 2021 Verdantix global corporate survey stated that reducing maintenance-related costs was ‘very important’ when investing in industrial asset management software in 2022 and 2023 – the highest out of seven options (see Verdantix Global Corporate Survey 2021: Operational Excellence Budgets, Priorities & Tech Preferences; see Figure 4). EAM software implementations bring with them increased maintenance efficiency, reduced asset downtime and, in turn, savings for maintenance budgets. As such, industrial firms are looking to EAM software to overhaul their maintenance processes and save on costs.

  “It gives a centralized platform for our assets and the asset management software produces in-depth reports and audits and contributes to controlling the cost of assets.” - Director of Fleet Operations, Manufacturer

- **Continued maintenance initiatives to improve asset reliability and uptime.**
  Reducing asset downtime is a core tenet of maintenance strategies and a key driver of investment in maintenance management software. Eighty-four per cent of the 256 respondents to the 2021 Verdantix global survey noted minimizing unplanned downtime as an ‘important’ driver for their firm to invest in asset management software in 2022 and 2023. Aroplax Corporation, a plastics injection moulding firm, overcame challenges with asset downtime through a renovation of its maintenance strategy with eMaint CMMS.
Factors Driving Investment In Operational Excellence

“Overall, we have been raising production, so it’s really important that we reduce downtime to meet production demands.” - Maintenance Director, Manufacturing

- **Demand for a single data platform that consolidates day-to-day software usage.**
  For workers at firms where day-to-day work can be analogue, digital or a combination of the two, the need to use multiple systems can over-complicate simple tasks. Increasingly, EAM vendors are integrating adjacent capabilities within their platforms, such as EHS and operational risk management (ORM) software. Ultimo provides EHS software as part of its EAM system, covering incident management and permit to work capabilities. Consolidating the software that workers use regularly – for maintenance task completion, risk assessments and incident management – improves efficiency. Operations and maintenance decision-makers recognise this: 55% of respondents to the 2021 Verdantix global survey highlighted the breadth of applications available on a single platform as ‘important’ when evaluating software for industrial asset management.

  "We were using a lot of different software tools such as spreadsheets which weren’t integrated with one another. This led to a lot of double work to fulfil simple requirements." – Project Manager, Speciality Chemical Manufacturer

- **Creation of a standardized, data-driven maintenance strategy at an enterprise level.**
  A key distinguishing factor between EAM and CMMS, as well as other legacy maintenance systems, is the scale of implementation. EAM is, by definition, enterprise-wide; it seeks to marry disparate processes across sites into a holistic maintenance strategy. Increasingly, operations and maintenance decision-makers expect asset management software to ingest data from across the wider business. Sixty-nine per

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**FIGURE 3**

Factors Driving Investment In Operational Excellence

“How significant will the following factors be in causing your firm to invest in operational excellence initiatives over the next two years?”

<table>
<thead>
<tr>
<th>Factor</th>
<th>Very Significant</th>
<th>Significant</th>
<th>Insignificant</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tougher regulations</td>
<td>26%</td>
<td>69%</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Availability of new digital technology</td>
<td>25%</td>
<td>69%</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Economic downturn</td>
<td>46%</td>
<td>38%</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>COVID-19 risk management</td>
<td>45%</td>
<td>40%</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Enterprise risk management strategies</td>
<td>41%</td>
<td>43%</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Cost cutting programme</td>
<td>36%</td>
<td>48%</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Minimizing industrial accidents</td>
<td>41%</td>
<td>41%</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>New CEO</td>
<td>28%</td>
<td>45%</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Mergers and acquisitions</td>
<td>29%</td>
<td>40%</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

Note: percentages less than 5% are displayed as numbers.
Source: Verdantix Global Corporate Survey 2020: Operational Excellence Budgets, Priorities & Tech Preferences

N=259
Drivers Of Investment In Asset Management Software In 2022 And 2023

“How important will the following factors be in causing your firm to invest in software for industrial asset management over the next two years?”

- Reducing maintenance-related costs: 71% Very important, 15% Important, 14% Unimportant, 0% Don’t know
- COVID-19-induced remote operations: 58% Very important, 13% Important, 29% Unimportant, 0% Don’t know
- Declining cost of IoT devices: 39% Very important, 41% Important, 20% Unimportant, 0% Don’t know
- Push from executive leadership team: 33% Very important, 52% Important, 14% Unimportant, 0% Don’t know
- Minimizing unplanned downtime: 30% Very important, 54% Important, 16% Unimportant, 0% Don’t know
- Firm's operational excellence strategy: 27% Very important, 48% Important, 24% Unimportant, 0% Don’t know
- Availability of new digital technology: 16% Very important, 75% Important, 9% Unimportant, 0% Don’t know

Note: percentages less than 5% are displayed as numbers
Source: Verdantix Global Corporate Survey 2021: Operational Excellence Budgets, Priorities & Tech Preferences

16% 27% 30% 33% 39% 58% 71% 75% 48% 54% 52% 41% 13% 29% 0%

“Cent of respondents to the 2021 Verdantix global survey described an open architecture for integration with industrial software, business systems and sensors as ‘important’ when evaluating software applications for industrial asset management – the highest out of 12 options. CHS, a US agribusiness cooperative, leverages representational state transfer application programming interfaces (REST APIs) within IBM Maximo to integrate data from across sites and inform its maintenance strategy.

“We looked into EAM software because we wanted to go from an independent, plant-by-plant maintenance approach to a more global strategy.” - Senior Solution Manager, Packaging Manufacturer

- **Rising pressure to improve operations sustainability at industrial sites.**
  Sustainability has risen up the corporate agenda since 2020, with investors increasingly demanding evidence of strategies to lower carbon emissions for the firms in which they invest. A letter to CEOs from Larry Fink, the CEO of BlackRock, in 2022 illustrated this fact, noting that sustainable investments have reached $4 trillion according to Broadridge, Morningstar and Simfund. A knock-on effect of investor demands around sustainability is the expectation that steps will be taken to improve operational sustainability – a reality that operations and maintenance decision-makers highlighted to Verdantix in our 2021 global survey. Forty-eight per cent of the 256 interviewees noted sustainable operations as a ‘high priority’ on which to improve in 2022 as part of their operational excellence initiatives. Infor (now HxGN EAM) launched its ‘Going Green’ initiative in December 2021 to educate customers on how its enterprise solutions, including its EAM software, can help reach sustainability goals.
Our maintenance strategies now have to align with our sustainability objectives to reduce our carbon footprint. With EAM software we can monitor equipment’s condition, understand energy usage and prevent breakdowns, which all contributes towards sustainability goals” - Director of Operations, Manufacturing Plant

**Spend On EAM Solutions Is Healthy For 2022 And Beyond**

Growth in the EAM software market is driven by digital transformation strategies, cost-cutting programmes, consolidation of applications, elimination of data silos, and sustainability priorities. Maintenance decision-makers are increasingly committing spend to EAM software. Our analysis finds that:

- **Global EAM software spend will reach $5.4 billion in 2026.**
  
  According to Verdantix analysis, the EAM software market was worth $3.6 billion in 2021 (see Verdantix Market Size And Forecast: Industrial Asset Management Software 2021-2026 (Global)). The majority of spend on EAM software remains concentrated in North America and Europe. The market outlook over the next five years is healthy; spend will reach $5.4 billion by 2026, rising at a CAGR of 8% (see Figure 5).

- **Ample opportunity exists for further EAM software uptake.**
  
  Twelve per cent of the 49 maintenance respondents to the 2021 Verdantix global corporate survey reported wide usage of EAM software across their operations, with a further 36% noting usage at multiple facilities (see Verdantix Global Corporate Survey 2021: Operational Excellence Budgets, Priorities & Tech Preferences). However, 18% recorded limited usage of EAM software at a few facilities and a further 8% had active pilot projects. This lack of business-wide coverage for EAM software highlights the significant white space in the market.
• **Investment in software supporting core EAM activities will rise in 2022.**

When queried about plans for investment in software for asset management activities, use cases catered to by EAM software were prominent among the responses. Forty-three per cent of the 49 maintenance respondents planned new spend on asset information management, while 24% were planning new spend on asset maintenance planning, scheduling and work order management. Ten per cent of respondents intended to upgrade their existing commercial software for inventory and spare parts management.

**EAM Software Providers Focus On Mobility, Predictive Analytics And Quick Implementation To Differentiate Their Offerings**

Investment in EAM software is healthy for 2022, with many organizations expanding their implementations and targeting spend for specific maintenance activities. Looking forward, EAM software vendors are innovating across several areas to differentiate, such as:

• **Continued development of mobile apps to build more comprehensive functionality.**

A major innovation within the asset maintenance software space over the past five years has been the introduction of mobile apps with offline capability. Point solutions, such as the digital work instructions authoring and distribution mobile apps provided by suppliers such as Innovapptive and Parsable, are frequently integrated with EAM systems to augment specific elements of the EAM value proposition (see [Verdantix Buyer’s Guide: Connected Worker Solutions](#)). For example, in January 2022 Innovapptive launched mobile solutions for IBM Maximo. Currently, mobile apps for EAM lack breadth of use cases, but vendors are working to provide more intuitive user interfaces (UIs) and comprehensive solutions.

> “When selecting our EAM solution, the mobile application was the main draw. We used an in-house mobile app at the time, but it wasn’t up to scratch.” – Project Manager, Speciality Chemical Manufacturer

• **Integration with wearables to streamline maintenance processes.**

A key vendor strategy that has emerged over the past 18-24 months, driven by the COVID-19 pandemic, is the integration of EAM software with industrial wearables. Head-mounted displays (HMDs) facilitate hands-free maintenance work and allow workers to receive remote assistance to carry out their work efficiently as well as safely. Ultimo has integrated with HoloNXT, a digital twin platform that makes use of the Microsoft HoloLens 2 HMD. Many connected worker software providers whose products are designed with wearables in mind have developed specific integrations with EAM solutions, such as those from Atheer and PTC.

> “We’ve explored wearables, such as RealWear’s headsets, for asset maintenance. We expect to roll those out next year.” – IT and Administration Manager, Upstream Gas

• **Development of advanced analytics to drive greater asset performance.**

Increasingly, EAM software vendors are developing capabilities for predictive analytics to drive proactive maintenance strategies (see [Verdantix Smart Innovators: Maintenance Analytics For Heavy Asset Industries](#)). These encompass automated maintenance task prioritization based on asset criticality, asset failure prediction, lifecycle costing for repair or replace decisions, and spare parts forecasting. Witness HxGN EAM, Hexagon’s EAM solution, which provides asset condition information updated via Internet of Things (IoT) devices, sensors and field inspections. The expanded functionality afforded by these features allows firms to move from a preventative maintenance strategy to a predictive approach, as well as providing insights for long-term asset investment plans.
“EAM has to have APIs for analytics. Currently, we don’t really see EAM providing those functions. We import some conditional monitoring data, but it’s quite basic” - Senior IT Director, Lumber Producer

- **Expansion of solution capabilities to cover applications adjacent to maintenance use cases.**
  Organizations are now seeking solutions that incorporate functionality across a maintenance worker’s entire work experience, including for use cases less frequently encountered and usage scenarios adjacent to maintenance processes. For example, some providers are including permit to work or incident management capabilities within EAM software. DevonWay’s platform houses health and safety and quality alongside its EAM functionality, in a strategy that seeks to reduce data silos between products and functions (see Verdantix DevonWay Offers A Broad Suite Of Solutions For EHSQ And Asset Management).

“*Our [EAM software] provider added PPE [personal protective equipment] management within our EAM solution. This wasn’t initially a part of the implementation, but considering the volume of data we were handling in spreadsheets, it was quicker than our previous method*” - Technical Services Supervisor, Electric Power Firm

- **Growth of cloud capabilities to reduce headaches over scaling and updates.**
  The benefits of cloud computing are self-evident. Cloud-hosted applications are easier to update, more scalable and more flexible than their on-premises counterparts. While many EAM implementations are still on-premise, the frequency of cloud deployments is increasing rapidly. EAM software providers such as eMaint, iOFFICE + SpaceIQ and Ramco Systems have cloud-only offerings, while others, such as IBM and Ultimo, have strategies in place to shift toward Software as a Service (SaaS) solutions.

“*From a tech perspective, we don’t have to worry any more. Using our EAM solution in the cloud, we’ve had only a day of downtime in the last three years.*” – IT and Administration Manager, Upstream Gas

### Green Quadrant For EAM Software 2022

Buyers of EAM software from heavy and light industries seek comprehensive, configurable and scalable solutions which enable strong foundations for asset information, work order and inventory management, alongside adjacent functionality such as operational risk management and driving asset performance improvement. For the purposes of this report, Verdantix defines EAM software as:

“*Enterprise-scale software that enables firms to manage assets throughout their life cycle to increase asset availability and uptime.*”

The assessment includes both applications deployed on-premise and those that are cloud-hosted.

### Green Quadrant Methodology

The Verdantix Green Quadrant methodology provides buyers of specific products or services with a structured assessment of comparable offerings at a certain point in time. The methodology supports purchase decisions by identifying potential vendors, structuring relevant purchase criteria through discussions with buyers and providing an evidence-based assessment of the products or services in the market. To ensure objectivity of the study results, the research process is guided by:

- **Transparent inclusion.**
  We aim to analyse all providers that qualify for inclusion in the research. For those providers that provide insufficient information or are unwilling to cooperate fully on the 207-point questionnaire and two-hour product demonstration, we include them in the report based on public information, where this would provide an accurate analysis of their market positioning.
• **Analysis from the market perspective.**
  We integrate findings from our latest global corporate operational excellence survey of 256 decision-makers, many of whom have bought or plan to buy software products such as those analysed in the Green Quadrant. The data-driven survey findings inform how we define the relevant software categories, sub-categories and weightings that propel the Green Quadrant graphic output.

• **Reliance on professional integrity.**
  As it is not feasible to check all data and claims made by vendors, we emphasize the need for professional integrity. Assertions made by software providers are put in the public domain via the Verdantix report and can be checked by competitors and existing customers. Verdantix also retains previous iterations of vendors’ Green Quadrant questionnaire responses and makes comparisons and scoring adjustments as needed, to ensure accuracy.

• **Scores based on evidence, briefings and customer interviews.**
  To assess software vendors’ expertise, resources, business results and strategies, we gather evidence from public sources and conduct interviews with multiple spokespeople and industry experts. When providers claim to be ‘best in class,’ we challenge them to present supporting evidence.

• **Scores based on relative comparisons.**
  We construct measurement scales ranging from ‘worst in class’ to ‘best in class’ performance at a certain point in time. A provider’s position in the market can change over time, depending on how its offering and success evolves relative to its competitors. As a result, a vendor’s quadrant positioning may not necessarily improve — even if it adds new applications, makes a strategic acquisition or receives investment — as the assessment is relative to what other vendors are offering or have been doing since the previous Green Quadrant study. The Green Quadrant analysis is typically repeated every 1.5 to 2 years.

**Scope And Methodology For The 2022 Green Quadrant EAM Software Study**

Verdantix studies reflect the current state of customer requirements and product capabilities. As such, we have developed the assessment criteria to ensure alignment with the current state of the market. In this first iteration of the 2022 Green Quadrant EAM software study, Verdantix:

• **Developed EAM scenarios from capability assessments.**
  In this initial iteration of the Green Quadrant for EAM software, Verdantix developed a set of the most important and relevant capability areas in which customers expect vendor functionality. Through feedback with vendors and customers, Verdantix developed a framework of 11 technical capabilities and 14 functional capability areas.

• **Weighted the questionnaire categories to reflect market priorities.**
  The Verdantix Green Quadrant evaluates the latest customer technology preferences, to ensure that the weightings of all high-level criteria reflect global buyers’ current priorities across all EHS software components. Following extensive interviews with 256 senior operational excellence decision-makers, Verdantix applied adjusted weightings for each high-level capability criterion to mimic its relative priority for improvement and to reflect EAM software spending plans for 2021 amongst customers.

• **Included coverage of customer success and adoption.**
  A key, and oftentimes overlooked, criterion into which customers require insight relates to the customer success strategies that vendors implement in the market. To account for these, Verdantix included questions
around total customer count, renewal rates and strategy. Furthermore, we undertook 10 customer interviews with users of vendor solutions highlighted in the Green Quadrant.

**Evaluated Providers: Selection Criteria**

Verdantix defined vendor inclusion criteria to ensure that the Green Quadrant analysis only compared firms providing similar services. The 14 EAM software providers included in this study were selected because they:

- **Have strong functionality to offer more than five out of the 14 EAM capabilities assessed.**
  We scanned the market to identify those vendors that offer more comprehensive EAM applications to manage the broad spectrum of asset maintenance needs being assessed, alongside additional functionality in areas adjacent to asset maintenance.

- **Have at least 50 employees, EAM software revenues of over $3m and five named customers.**
  The Verdantix Green Quadrant EAM software study is intended to assess the most prominent vendors offering EAM platform solutions. All vendors disclosed at least five named customers who adopted and deployed their software for EAM use cases in 2021.

- **Have an enterprise offering that can be deployed at more than one site.**
  Given the nature of EAM software as enterprise-wide, vendors were only included if their solutions could be deployed at multiple sites across a business.

- **Possess the resources to deliver a broad EAM suite.**
  We focused the study on vendors with the human, financial and technological resources to meet the needs of diverse customers for the foreseeable future. This criterion reflects the desire of most customers to ultimately use a comprehensive and integrated platform to manage all their EAM requirements globally.

Based on the inclusion criteria above, this report looks in depth at the EAM software platforms available from 14 vendors: Accruent, Aptean, DevonWay, Brightly Software (formerly Dude Solutions), eMaint, IBM, Hexagon, iOFFICE + SpaceIQ, Nuvolo, Pragma, Ramco, SAP, Ultimo and UpKeep. Accruent, Brightly Software, DevonWay, Hexagon, iOFFICE + SpaceIQ, Nuvolo, Pragma, Ultimo and UpKeep participated actively in the study with complete responses to the questionnaire. eMaint provided a live product demonstration and briefing but did not complete the questionnaire. Aptean, IBM, Ramco Systems and SAP were invited to participate, but either declined or did not respond.

**Evaluation Criteria For EAM Software**

Verdantix defined the evaluation criteria for the Green Quadrant EAM software study using a combination of interviews with corporate practice managers and software executives, desk research, discussions with multiple customers and staff expertise. Analysis was also informed by responses to the Verdantix global corporate operational excellence surveys. In full, this year’s Green Quadrant analysis compares offerings from 14 software vendors using a 207-point questionnaire covering 11 categories of technical capabilities, 14 categories of functional capabilities and nine categories of market momentum. In our analysis:

- **Capabilities measure the breadth and depth of functionality.**
  The Capabilities dimension, plotted on the vertical axis of the Green Quadrant graphic, is a measure of the breadth and depth of each software provider’s functionality. To assess this, we evaluated data for 11 technical capabilities and 14 functional capabilities. These technical capabilities were: application and data centre security; business intelligence; code base consistency; configurability; database – relational
and graph; deployment options; development environment; integrations; mobile app product architecture; mobile app product use cases; and user interfaces. The functional capabilities were: asset information management; audit management; contractor management; customer management; inspection management; maintenance analytics; materials and inventory management; mobile app product portfolio and use cases; operational risk management; procurement management; project management; resource planning; work management; and workforce management (see Figure 6-1 and Figure 6-2).

- **Momentum measures strategic success factors.**
The Momentum dimension, plotted on the horizontal axis of the Green Quadrant graphic, measures each software vendor on a range of strategic success factors. The criteria that make up the Momentum score are grouped into nine high-level categories: acquisitions; certifications; commercial strategy; customers; customer success and adoption; financial resources; innovation strategy; organizational resources; and partnerships (see Figure 7-1 and Figure 7-2). The evidence provided by all the software vendors was assessed using a quantitative model that started with the sub-criteria scores. Each sub-criterion was equally weighted, to generate the overall score for each capability area. For example, maintenance analytics is one of the high-level criteria evaluated in the Capabilities section, but is also composed of six weighted sub-criteria that determine the overall incident management score.

All sub-criteria were scored between the values of zero ('no capability') and three ('best in class'). Subsequently, each high-level criterion was allocated a percentage weighting that determined its contribution to the overall score for the specific capability. Weightings were based on customer survey data regarding the EAM software functionalities that are most widely used, along with analyst perceptions of the broader EAM software landscape. The combination of high-level criteria scores in the Capabilities and Momentum sections generated the Green Quadrant graphic (see Figure 8) and rankings (see Figure 9 and Figure 10).
## Functional Capabilities Criteria For EAM Software

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Information Management</td>
<td>What functionality do you offer for managing and integrating asset histories? What functionality do you offer for creating, managing and integrating asset hierarchies and registries? What functionality do you offer for managing and integrating spatial information for assets? What functionality do you offer for calculating and capturing asset criticality/risk ratings?</td>
</tr>
<tr>
<td>Audit Management</td>
<td>What functionality do you offer for auditing events such as asset failures or accidental damages? What functionality do you offer for creating audit documents? What functionality do you offer for assigning severity to events?</td>
</tr>
<tr>
<td>Contractor Management</td>
<td>What functionality do you offer for managing contractor information? What functionality do you offer for assigning work orders to third-party contractors?</td>
</tr>
<tr>
<td>Customer Management</td>
<td>What functionality do you offer for managing customer contracts, invoices and templates? What functionality do you offer for reservation tracking?</td>
</tr>
<tr>
<td>Inspection Management</td>
<td>What functionality do you offer for inspection planning and organization? What functionality do you offer for scheduling point inspections? What functionality do you offer for classifying inspections and capturing results? What functionality do you offer for creating checklists? Do you offer out-of-the-box checklist templates?</td>
</tr>
<tr>
<td>Maintenance Analytics</td>
<td>What functionality do you offer for monitoring the condition of assets? What functionality do you offer for planning and scheduling maintenance work? Do you offer analytics to inform the priority of tasks based on criticality of assets and associated incidents? What functionality do you offer for predicting asset failure? What functionality do you offer for costing assets and related work across their life cycle?</td>
</tr>
<tr>
<td>Materials &amp; Inventory Management</td>
<td>What functionality do you offer for managing product stewardship activities such as cradle to grave management, hazardous materials management, and social and environmental impact assessments? What functionality do you offer for spare parts and inventory management? What functionality do you offer for tracking the location of assets?</td>
</tr>
<tr>
<td>Mobile App Product Portfolio &amp; Use Cases</td>
<td>What mobile functionality do you offer for the following: (1) resource planning; (2) work management; (3) procurement management; (4) contractor management; (5) materials and inventory management; (6) audits and inspections; (7) project management; (8) incident management; (9) permit to work; (10) lockout-tagout; and (11) customer management?</td>
</tr>
</tbody>
</table>

Figures in brackets represent the weighting given to each criterion in the flexible multi-criteria model that generates the Green Quadrant graphical analysis.

Source: Verdantix analysis
## Functional Capabilities Criteria For EAM Software

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Questions</th>
</tr>
</thead>
</table>
| **Operational Risk Management**<br>(5%) | What functionality do you offer for capturing, managing and analysing worker incidents, including near-misses? How does your incident management module integrate with other EAM modules?  
What functionality do you offer for managing lockout-tagout processes?  
What permit to work functionality do you offer? This includes permit type libraries as well as approval and tracking workflows. How does your permit to work integrate with other EAM modules?  
What management of change functionality is available to handle workflows, approvals, data change controls, etc? How does your MOC module integrate with other EAM modules? |
| **Procurement Management**<br>(3%) | What functionality do you offer for managing purchase orders?  
What functionality do you offer for managing procurement documents?  
What functionality do you offer for planning and budgeting of procurement?  
What functionality do you offer for capturing ESG and sustainability data during the procurement process? |
| **Project Management**<br>(3%) | What functionality do you offer for planning and organizing projects such as equipment installations or overhauls? Is this functionality native to your EAM software or provided in partnership with other vendors?  
What functionality do you offer for project budgeting and forecasting cost estimations?  
What functionality do you offer for the scheduling and execution of projects? |
| **Resource Planning**<br>(3%) | What functionality do you offer for modelling the depreciation of an asset?  
What functionality do you offer for managing warranties and claims?  
What functionality do you offer for tracking the remaining service life of an asset?  
What functionality do you offer for managing capital project spend? |
| **Work Management**<br>(8%) | What functionality do you offer for managing the creation and approval of work orders?  
What functionality do you offer for managing the assignment, scheduling and completion of work orders?  
What functionality do you offer for tracking multi-asset work orders?  
What functionality do you offer for managing maintenance patterns and campaigns?  
What functionality do you offer for revision control? |
| **Workforce Management**<br>(3%) | What functionality do you offer for integrating and managing human resource databases?  
What functionality do you offer for managing and tracking competencies and certifications?  
What functionality do you offer for tracking work hours and visualizing worker activities? |

Figures in brackets represent the weighting given to each criterion in the flexible multi-criteria model that generates the Green Quadrant graphical analysis.

Source: Verdantix analysis
# Momentum Criteria For EAM Software

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisitions (5%)</td>
<td>What EAM-related acquisitions have you made in the last three years?</td>
</tr>
<tr>
<td>Certifications (3%)</td>
<td>Which standards bodies is your firm a member of? What accreditations does your firm hold?</td>
</tr>
<tr>
<td>Commercial Strategy (6%)</td>
<td>What is your firm's vision for the target customers/addressable market opportunity you seek to target over the next five years? How do you intend to achieve the vision? What is your firm's strategy to meet the needs of your target customers over the next five years?</td>
</tr>
<tr>
<td>Customers (20%)</td>
<td>What is your total number of customers? How many of your customers are EAM using your firm's software products? How many users are actively using your EAM software? How many new EAM customers did you gain in 2021? What was the renewal rate for EAM software customers in 2021? What was the renewal rate for EAM software customers by contract value in 2021?</td>
</tr>
<tr>
<td>Customer Success &amp; Adoption (20%)</td>
<td>How many FTE employees are dedicated to customer success and account management? How many client accounts, on average, are each responsible for? Detail the availability and location of customer care/support and differing levels of support offered. What types of support services are typically requested? What is the average response time? Please detail the asset management services offered in-house that exist to support implementation and user training. Please detail the EAM vendor services that exist to support ongoing user adoption/engagement and active use of your software solutions. Among customers that deployed your EAM software from 2015 onwards, what was the average number of active users at the 3-month mark versus at the 24-month mark? What is your customer retention rate in the most recent reporting year compared with the year before?</td>
</tr>
<tr>
<td>Financial Resources (20%)</td>
<td>What were your annual revenues for 2020/2021? What percentage of one year overall revenue growth was organic? What percentage of one year overall revenue growth was inorganic by acquisition? What percentage of total revenue relates to EAM use cases? What percentage of one year revenue growth related to EAM use cases was organic? What percentage of one year revenue growth related to EAM use cases was inorganic by acquisition? How much funding have you received from profit or capital markets?</td>
</tr>
</tbody>
</table>

Figures in brackets represent the weighting given to each criterion in the flexible multi-criteria model that generates the Green Quadrant graphical analysis.

Source: Verdantix analysis
### Momentum Criteria For EAM Software

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Questions</th>
</tr>
</thead>
</table>
| **Innovation Strategy**<br>(10%) | What is your firm's industrial EAM and IIoT digital ecosystem product strategy for the next two to five years?  
What is your firm's strategy when it comes to R&D investment allocations to support long-term viability and maintain competitive advantage(s)?  
What percentage of your revenue was invested as R&D in 2021?  
How do you manage new functionality releases? |
| **Organizational Resources**<br>(10%) | What is your total number of employees?  
What is the percentage change in your employee numbers over the last two years?  
How many of your total employees are dedicated to EAM software?  
In how many and in which countries does your firm have an office?  
In how many locations (specify) does your firm host the application? Where are your global points of presence for data centres? |
| **Partnerships**<br>(6%) | With which consulting firms does your firm have a formal relationship?  
What percentage of your firm's total revenues are generated from EAM services?  
Which software development partners did your firm work with?  
With which IIoT vendors does your firm have a formal relationship?  
With which EAM-related industry groups does your firm work with? |

Figures in brackets represent the weighting given to each criterion in the flexible multi-criteria model that generates the Green Quadrant graphical analysis.

Source: Verdantix analysis
MOMENTUM

Capabilities  This dimension measures each software supplier on the breadth and depth of its software functionality across 25 capability areas.

Momentum  This dimension measures each software supplier on nine strategic success factors.

Source: Verdantix analysis
Note: a grey plot indicates a non-participating vendor
## EAM Software Vendor Capability Scores

<table>
<thead>
<tr>
<th>Feature</th>
<th>Accruent</th>
<th>Aptean</th>
<th>Brightly Software</th>
<th>DevonWay</th>
<th>elfant</th>
<th>Hexagon</th>
<th>IBM</th>
<th>J/Office + SpaceQ</th>
<th>Nuvolo</th>
<th>Pragma</th>
<th>Ramco</th>
<th>SAP</th>
<th>Ultimo</th>
<th>UpKeep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application &amp; Data Centre Security</td>
<td>1.7</td>
<td>1.3</td>
<td>2.2</td>
<td>2.2</td>
<td>1.1</td>
<td>2.2</td>
<td>2.0</td>
<td>1.7</td>
<td>2.5</td>
<td>1.9</td>
<td>1.1</td>
<td>1.5</td>
<td>1.9</td>
<td>1.6</td>
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<tr>
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<tr>
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<td>Platform - Configurability</td>
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<tr>
<td>Platform - Development Environment</td>
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<td>Operational Risk Management</td>
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<tr>
<td>Maintenance Analytics</td>
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<tr>
<td>Mobile App Product Portfolio/Use Cases</td>
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</tbody>
</table>

**Scoring Framework**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Vendor provides evidence of market-leading functionality, supported by a broad set of references to customer examples</td>
</tr>
<tr>
<td>2</td>
<td>Vendor provides evidence of strong functionality, supported by a broad set of references to customer examples</td>
</tr>
<tr>
<td>1</td>
<td>Vendor provides evidence of moderate functionality, with limited references to customer examples</td>
</tr>
<tr>
<td>0</td>
<td>No response provided or available publicly, or supplier has a weak offering</td>
</tr>
</tbody>
</table>

*Source: Verdantix analysis*

Note 1: resource planning includes budgeting and financial information
## FIGURE 10

### EAM Software Vendor Momentum Scores

<table>
<thead>
<tr>
<th></th>
<th>Accruent</th>
<th>Aptean</th>
<th>Brightly Software</th>
<th>DevonWay</th>
<th>eMaint</th>
<th>Hexagon</th>
<th>IBM</th>
<th>iOFFICE + SpaceIQ</th>
<th>Nuvolo</th>
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<th>SAP</th>
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### Scoring Framework

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<th>Score</th>
<th>Description</th>
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<td>3</td>
<td>Vendor provides evidence of market-leading functionality, supported by a broad set of references to customer examples</td>
</tr>
<tr>
<td>2</td>
<td>Vendor provides evidence of strong functionality, supported by a broad set of references to customer examples</td>
</tr>
<tr>
<td>1</td>
<td>Vendor provides evidence of moderate functionality, with limited references to customer examples</td>
</tr>
<tr>
<td>0</td>
<td>No response provided or available publicly, or supplier has a weak offering</td>
</tr>
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Source: Verdantix analysis
Brightly Software Leverages Acquisitions To Deliver A Comprehensive EAM Solution And Expand Its International Presence

Formerly Dude Solutions, Brightly Software is headquartered in Cary (North Carolina), USA, with offices in Australia, Canada and the UK. Brightly raised $100 million in private equity funding in 2014 and was acquired by Clearlake Capital, an investment firm, in 2019. Brightly has expanded its international presence as well as its asset management solution offering through a series of strategic acquisitions. These started with the purchase of Australian asset management software provider Assetic, and Confirm, the asset management software business unit of UK-based Precisely, in 2020, and have continued in 2022 with the acquisition of Energy Profiles Limited, a Canadian analytics software provider. Brightly’s core industries are education and government, life sciences and manufacturing, with some customers in oil and gas, power utilities and transportation. The firm has over 600 employees dedicated to its EAM and CMMS solutions.

Strengths And Differentiators

Based on the Green Quadrant analysis, Verdantix finds that Brightly has strengths in:

- **Application and data centre security.**
  Brightly scored 2.2/3.0 for application and data centre security, which is significantly above the Green Quadrant average of 1.8/3.0 for this category. Brightly recorded 99.9% compliance with service level agreements (SLAs). Additionally, the recovery time objective (RTO) is one hour and the recovery point objective (RPO) is one minute. Data centres receive annual SSAE 16 Type II SOC-1 and SOC-2 control audits alongside PCI-DSS certification and are compliant with ISO 27001/27002.

- **Work management, especially from a budgeting perspective.**
  Brightly scored joint top for work management capabilities (2.3/3.0). Brightly EAM allows for the automatic raising of work orders based on the creation of specific enquiry or defect records via the desktop or mobile application. The location at which work orders are to be carried out can be visualized on a map view of the industrial site, and users can program Brightly EAM to authorize work orders only when a series of checks are complete. For example, the solution can check the cost of a job against budgets to ensure these are not exceeded. Through integration with external finance systems, it will withhold job authorization until this is granted in the external system. Additionally, when raising work orders, the solution can include work safety management applications such as hazard identification.

- **Mobile app functionality.**
  Brightly scored 1.8/3.0 for its mobile app product portfolio and use case coverage, against an average of 1.2/3.0. Functionality is particularly strong for workers recording job progress: Brightly EAM users can view job details and record work progress on the mobile app, update attributes related to the job such as risk assessments, and attach associated photographs and documents. Users can also record their labour, plant and material costs within the app.
Improvement Opportunities

Based on the Green Quadrant analysis, Verdantix finds that Brightly could improve by:

- **Enhancing its forecasting capabilities for materials and inventory management.**
  Brightly’s capabilities for materials and inventory management are below average, with a score of 1.2/3.0 compared with the Green Quadrant average of 1.7/3.0. Brightly EAM software allows users to view inventory levels at specific locations and to set minimum stock requirements. More advanced materials and inventory management capabilities would entail the forecasting of stock levels and associated costs based on future work.

- **Developing its maintenance analytics.**
  While Brightly scored 1.6/3.0 for maintenance analytics, which is slightly above average for this category, there is room for improvement. The firm excels at asset lifecycle costing, allowing users to view asset costs against maintenance activities and enabling capital investment planning via industry-specific algorithms. However, capabilities for asset failure prediction and for ascertaining asset criticality are less developed, with the solution lacking the functionality to leverage criticality assessment methodologies such as failure mode and effect analysis (FMEA) or Weibull analysis. Brightly should consider partnerships with AI analytics and predictive maintenance software providers such as C3 AI, Senseye and Symphony Industrial AI to enhance its analytics capabilities. In the 2020 Verdantix global corporate survey, 62% of the 259 respondents assessed analytics to predict asset failure as a significant digital innovation for their firms in 2021 and 2022 (see Verdantix Global Corporate Survey 2020: Operational Excellence Budgets, Priorities & Tech Preferences).

Selection Advice For Buyers

Considering all supplier offerings assessed in the Green Quadrant analysis, we believe that Brightly should be shortlisted by:

- **North American infrastructure and manufacturing firms seeking comprehensive EAM software.**
  The majority of Brightly’s 3,500 EAM customers belong to the infrastructure, government and manufacturing sectors, with clientele across food and beverage, fast-moving consumer goods, heavy equipment, industrial machinery and pharmaceuticals. Moreover, over 95% of Brightly’s customer base is headquartered in North America. Brightly’s strong work order capabilities make it a good fit for manufacturing firms looking to streamline often cumbersome work order management processes. Witness Pepsi Bottling Ventures (PBV), a North American bottling firm, which implemented Brightly EAM and eliminated lost work orders in the process. Other customers using Brightly’s EAM software are Balfour Beatty, Highways England (National Highways) and Tekni-Plex.

- **Firms in need of a well-wrought mobile app and a partially user-driven update process.**
  Brightly’s mobile app provides strong functionality for work, contractor and parts procurement management, alongside audits and inspections. To drive continuous improvement, Brightly works with users to implement suggested changes to the mobile app user experience. For example, the client ideas portal allows for votes on user-submitted ideas, which are reviewed on a weekly basis by the Brightly team for inclusion in future releases.
Through our research activities and independent brand positioning we provide clients with:

- Research relationships based on an annual research subscription
- Confidential advisory services such as commercial due diligence
- Thought leadership studies for brand building and lead generation
- Executive summits, roundtables and webinars
- Advisory workshops to rapidly increase your sector knowledge
- Multi-country and complex customer survey projects
- Marketing campaign support with analysts and content

**Verdantix Market Coverage**

**Environment, Health & Safety**
Focuses on the software and services markets that enable corporations to improve their performance across environment, health and safety including compliance, risk and performance.

**Operational Excellence**
Focuses on helping managers in operations, asset reliability, process safety and maintenance roles to leverage technologies which enhance production reliability, asset health and operational safety.

**Smart Building Technologies**
Focuses on software, intelligent building technologies and consulting services that enable real estate and facilities executives to optimize the value and performance of their building portfolios.

**ESG & Sustainability**
Focuses on the decisions of investors, tech providers, financial services firms and corporate leaders. Conducting in-depth research on the full range of services and technologies required to succeed with ESG and sustainability strategies.

**Why Verdantix?**

Verdantix is an independent research and advisory firm with expertise in digital strategies for Environment, Health & Safety, ESG & Sustainability, Operational Excellence and Smart Buildings. Our mission is to anticipate the insights and data that our clients need so you can succeed with growth strategies, invest wisely and optimize performance.

[www.verdantix.com](http://www.verdantix.com)