FROST & SULLIVAN

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intel®

2015 Global Smart Buildings
Visionary Innovation Leadership Award

FROST & SULLIVAN

50 Years of Growth, Innovation & Leadership

Contents

Background and Company Performance

Industry Challenges

Globally, one of the major challenges affecting participants in the smart buildings industry is the knowledge gap between the solution provider and the stakeholders of the decision-making unit (DMU). The lack of technical know-how for designing and developing smart building solutions in the DMU needs to be addressed by the companies in the industry. Educating the decision makers on the available technology that focuses on the unmet needs of the building owners and end users becomes the core part of the challenge in order to convince and secure projects.

Competition to capitalize on the available market opportunity arises from both new entrants and incumbents in the smart building solutions industry. Differentiation in the solutions offered and solutions priced at scalable points forms the key to addressing the huge market opportunity. Bridging the opportunity and the unmet needs of the end customer with unique selling points of the solution provider forms the crux of the challenge.

Focus on the Future and Best Practices Implementation

Intel Corporation's Internet of Things (IoT) solution for smart buildings, comprising gateways; processors such as Quark X1000, Atom E3800 family, Intel Core family; and software such as Wind River VxWorks, Linux, Wind River Edge Management, Intel Datacenter Manager, Intel® Security Embedded Control for securing data and devices, Expressway API Manager (Intel EAM) and Expressway Tokenization Broker (Intel ETB) for service management, focuses on the unmet needs of the customers and addresses visionary scenarios of the future.

Focus on Unmet Needs

Interoperability of devices, harmonization to share information between systems and from outside the smart building solution, and security of the buildings' information are the key unmet needs of the smart buildings industry. Intel supports only standard communication protocols for both wired and wireless communication media, and has mechanisms such as a universal protocol translation layer, as well as positioning systems, to enable data share between legacy systems running on proprietary protocols and standard communication protocols. Also, it allows for the incorporation of external data such as weather forecasts and location positioning.

Intel's Intel® Security security portfolio offers levels of necessary protection and privacy of shared data and processed information throughout the network. Intel's IoT framework tightly integrates and automates data manageability, security and analytics capabilities of the solution into an end node to cloud platform. The service layer of the IoT solution for smart buildings interacts with the service or a subscription model of the solution and allows for appropriate business execution, direct serviceability, and payments.

Such a holistic solution forms the key differential in terms of the unique value proposition it has for smart buildings. There is a high level of acceptance and positive feedback from customers for Intel's main capabilities, such as security and manageability, in the complete gateway solution.

Visionary Scenarios through Mega Trends

Intel's IoT solution for smart buildings is in alignment with the Connectivity and Convergence mega trend and leverages other critical mega trends such as Smart is the New Green, and Innovating to Zero. The business case of Intel's value proposition commenced 5 to 8 years ago. Intel recognized that there are enough connected devices in the field for the IoT to evolve and in line with the IoT evolution it pursued a corporate strategy to align itself with not only smart building solutions but also with other businesses.

Intel executed the strategy, resulting in its acquisitions of software and security building blocks providers such as Wind River and Intel® Security. Utilizing these new and existing assets, Intel commenced its new business unit, Smart Buildings, adding to other dedicated teams for IoT business opportunities in retail, homes, industrial, transportation utilizing synergies between these related segments. As a result of these actions, there is a positive synergy to welcome the value proposition and the business case of the company in the BT industry. KMC Controls, Daikin, Dell, HCL Technologies, Yanzi, and Yoga Systems are a few of the companies that have partnered with Intel to offer IoT solutions for building automation, home automation, and energy management.

Growth Pipeline

Intel's roadmap is a bottom-up approach defining every single element of each building block and the entire IoT solution. The company also has a dedicated roadmap, which defines specific IoT frameworks for sectors including building automation, smart homes, and energy management. These roadmaps are targeted directionally towards success in design wins and hence, boosting the company's revenues. In terms of individual elements, the company intends to release hardware and software blocks in a specific cadence to the market and build upon the entire solution in that cadence. The IoT solution is tailored to scale and cater to the lowest end according to the requirements based on the number of gateways and price points. Intel has developed and introduced a new set of Central Processing Units (CPUs) or System-on-Chip (SoC) such as the Quark in addition to Atom technology to address scalability. The company's roadmap is flexible and adjusted for tapping into the new opportunities that will emerge within the smart buildings market in the coming years.

Growth Performance

The IoT itself and IoT solutions for smart buildings are still in a nascent stage. The market

potential offers vast business growth opportunities for participants. Intel's in-house assets and its capability to integrate all its assets into a single solution have strongly positioned the company as a leading IoT solution provider of hardware and software platform building blocks for smart building solution.

The company's new developments such as offering very low power-consuming low-cost solutions to the market and in-house technological innovation through its many factories enable it to scale broader solutions to not only serve the existing unmet needs, but also address new IoT requirements such as security and manageability of devices. This unique positioning of Intel will propel the company's growth in the future.

Operational Efficiency

Intel continuously collects feedback from the customer and intelligence from the market pertaining to the evolving requirements and technological developments via its sales and marketing teams. The company then incorporates them into its operations to keep pace with the emerging market trends and fulfill evolving customer preferences to stay ahead of competition. This paves the way for continuous optimization of the technology that Intel offers. The company has defined processes in place in the factory, such as 'copy exactly', which allows it to optimize its products and solutions as much as possible to make sure the innovation reaches the market as swiftly as possible.

Technological Sophistication

The sophistication in Intel's IoT solution for smart buildings is a result of close collaboration with and synergy between its different business units. This is clearly visible from the solution because the integration of hardware, software, and functionalities into a single platform is the outcome of transparency, communication, and efficiency of Intel's security solution from Intel® Security, together with teams from Wind River.

The company's business segments have teamed up to offer a seamless and secure IoT platform with reference designs so that the BT companies can build their solution upon the platform and optimize the solution offered to their customers according to their requirements. Platform capabilities include Intel® security software that sets the standard for end-to-end IoT security, and security surveillance and data security solutions from other Intel business units. The teamed approach of Intel has enabled it to provide the security solution from a device to software layer, operating system, and application layer.

This differentiates Intel from other participants in the area of IoT solutions for smart buildings, as the competitors will have to rely on third-party solutions for a complete IoT solution. Intel clearly understands how operating technology to information technology works, which reflects in the design wins, so far. This rich technical know-how gives an edge to the company over competition. Intel has the technical infrastructure that IoT solutions require for smart buildings and other application segments of IoT, and IoT fits very well in its corporate strategy. This synergy between the company and the market

trends enables Intel to stand out from competition.

Conclusion

Intel Corporation's effective alignment of its corporate strategy with visionary scenarios and emerging mega trends in its efforts to address the unmet as well as the futuristic needs has enabled the company to offer a seamless and secure single IoT solution for the smart buildings industry. The solution can be readily applied to help property owners optimize revenues, improve operations, and enhance the comfort level and overall experience of occupants. The technological sophistication of its IoT solution, coupled with the company's operational efficiency and growth roadmap, clearly highlights Intel's visionary excellence. The company's partnerships with BT companies by assisting them with reference designs for developing their own IoT solutions, in addition to the solution itself, have been significantly instrumental in marking Intel's success in the smart buildings space.

With its strong overall performance, Intel Corporation has earned Frost & Sullivan's 2015 Visionary Innovation Leadership Award.

Significance of Visionary Innovation Leadership

A visionary innovation leadership position enables a market participant to deliver highly competitive products and solutions that transform the way individuals and businesses perform their daily activities. Such products and solutions set new, long-lasting trends in how technologies are deployed and consumed by businesses and end users. Most important, they deliver unique and differentiated benefits that can greatly improve business performance as well as individuals' work and personal lives. These improvements are measured by customer demand, brand strength, and competitive positioning.

Understanding Visionary Innovation Leadership

Visionary Innovation is the ability to innovate today in the light of perceived changes and opportunities that will arise from Mega Trends in the future. It is the ability to scout and detect unmet (and as yet undefined) needs and proactively address them with disruptive solutions that cater to new and unique customers, lifestyles, technologies, and markets. At the heart of visionary innovation is a deep understanding of the implications and global

ramifications of Mega Trends, leading to correct identification and ultimate capture of niche and white-space market opportunities in the future.

Key Benchmarking Criteria

For the Visionary Innovation Leadership Award, Frost & Sullivan analysts independently evaluated two key factors—Focus on the Future and Best Practices Implementation—according to the criteria identified below.

Focus on the Future

Criterion 1: Focus on Unmet Needs
Criterion 2: Visionary Scenarios through Mega Trends
Criterion 3: Growth Pipeline
Criterion 4: Blue Ocean Strategy
Criterion 5: Growth Performance

Best Practices Implementation

Criterion 1: Vision Alignment
Criterion 2: Process Design
Criterion 3: Operational Efficiency
Criterion 4: Technological Sophistication
Criterion 5: Company Culture

Best Practice Award Analysis for Intel Corporation
Decision Support Scorecard

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard. This tool allows our research and consulting teams to objectively analyze performance, according to the key benchmarking criteria listed in the previous section, and to assign ratings on that basis. The tool follows a 10-point scale that allows for nuances in performance evaluation; ratings guidelines are illustrated below.

RATINGS GUIDELINES
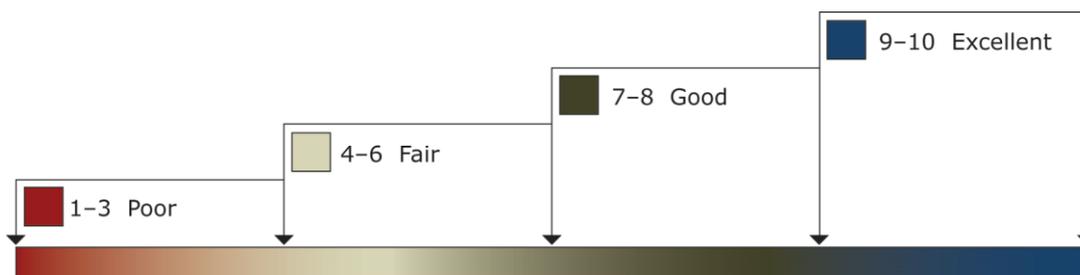
The Decision Support Scorecard is organized by Focus on the Future and Best Practices Implementation (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criteria are provided beneath the scorecard). The research team

confirms the veracity of this weighted scorecard through sensitivity analysis, which confirms that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.

The results of this analysis are shown below. To remain unbiased and to protect the interests of all organizations reviewed, we have chosen to refer to the other key players as Competitor 2 and Competitor 3.

DECISION SUPPORT SCORECARD FOR VISIONARY INNOVATION LEADERSHIP AWARD

Measurement of 1–10 (1 = poor; 10 = excellent)			
Visionary Innovation Leadership	Focus on the Future	Best Practices Implementation	**Average Rating**
Intel Corporation	9	9	9
Competitor 2	8	7	7.5
Competitor 3	7	7	7

Focus on the Future

Criterion 1: Focus on Unmet Needs

Requirement: Implementing a robust process to continuously unearth customers' unmet or under-served needs, and creating the products or solutions to address them effectively

Criterion 2: Visionary Scenarios through Mega Trends

Requirement: Incorporating long-range, macro-level scenarios into the innovation strategy, thereby enabling "first to market" growth opportunities solutions

Criterion 4: Growth Pipeline

Requirement: Best-in-class process to continuously identify and prioritize future growth opportunities leveraging both internal and external sources

Criterion 3: Blue Ocean Strategy

Requirement: Strategic focus in creating a leadership position in a potentially "uncontested" market space, manifested by stiff barriers to entry for competitors

Criterion 5: Growth Performance

Requirement: Growth success linked tangibly to new growth opportunities identified though visionary innovation

Best Practices Implementation

Criterion 1: Vision Alignment

Requirement: The executive team is aligned on the organization's mission, vision, strategy and execution

Criterion 2: Process Design

Requirement: Processes support the efficient and consistent implementation of tactics designed to implement the strategy

Criterion 3: Operational Efficiency

Requirement: Staff performs assigned tactics seamlessly, quickly, and to a high quality standard

Criterion 4: Technological Sophistication

Requirements: Systems enable companywide transparency, communication, and efficiency

Criterion 5: Company Culture

Requirement: The executive team sets the standard for commitment to customers, quality, and staff, which translates directly into front-line performance excellence

Decision Support Matrix

Once all companies have been evaluated according to the Decision Support Scorecard, analysts can then position the candidates on the matrix shown below, enabling them to visualize which companies are truly breakthrough and which ones are not yet operating at best-in-class levels.

DECISION SUPPORT MATRIX FOR VISIONARY INNOVATION LEADERSHIP AWARD
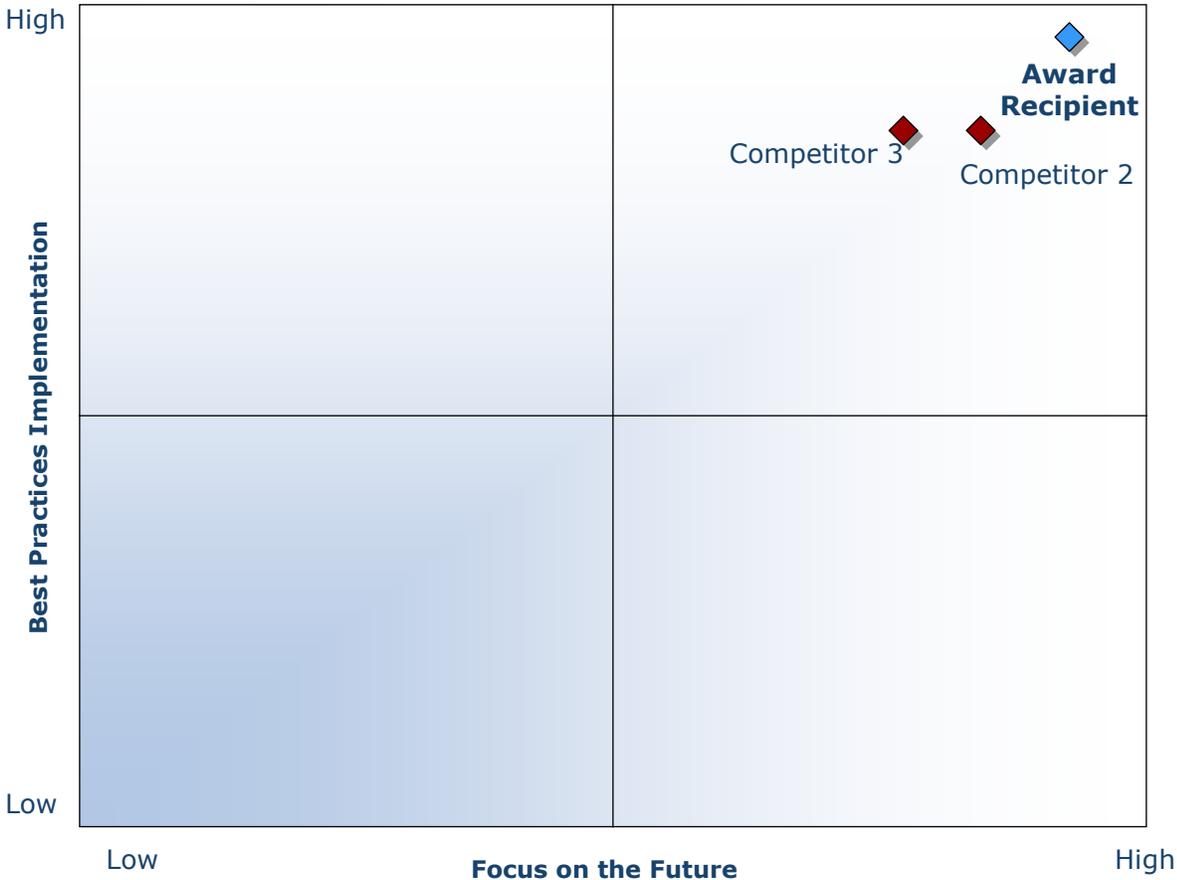
The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree-view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often, companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry players and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan awards follow a 10-step process to evaluate award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 **Monitor, target, and screen**	Identify award recipient candidates from around the globe	• Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies	Pipeline of candidates who potentially meet all best-practice criteria
2 **Perform 360-degree research**	Perform comprehensive, 360-degree research on all candidates in the pipeline	• Interview thought leaders and industry practitioners • Assess candidates' fit with best-practice criteria • Rank all candidates	Matrix positioning all candidates' performance relative to one another
3 **Invite thought leadership in best practices**	Perform in-depth examination of all candidates	• Confirm best-practice criteria • Examine eligibility of all candidates • Identify any information gaps	Detailed profiles of all ranked candidates
4 **Initiate research director review**	Conduct an unbiased evaluation of all candidate profiles	• Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles	Final prioritization of all eligible candidates and companion best-practice positioning paper
5 **Assemble panel of industry experts**	Present findings to an expert panel of industry thought leaders	• Share findings • Strengthen cases for candidate eligibility • Prioritize candidates	Refined list of prioritized award candidates
6 **Conduct global industry review**	Build consensus on award candidates' eligibility	• Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates	Final list of eligible award candidates, representing success stories worldwide
7 **Perform quality check**	Develop official award consideration materials	• Perform final performance benchmarking activities • Write nominations • Perform quality review	High-quality, accurate, and creative presentation of nominees' successes
8 **Reconnect with panel of industry experts**	Finalize the selection of the best-practice award recipient	• Review analysis with panel • Build consensus • Select winner	Decision on which company performs best against all best-practice criteria
9 **Communicate recognition**	Inform award recipient of award recognition	• Present award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance	Announcement of award and plan for how recipient can use the award to enhance the brand
10 **Take strategic action**	Upon licensing, company may share award news with stakeholders and customers	• Coordinate media outreach • Design a marketing plan • Assess award's role in future strategic planning	Widespread awareness of recipient's award status among investors, media personnel, and employees

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best in class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages almost 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 31 offices on six continents. To join our Growth Partnership, please visit http://www.frost.com.