Educational and Entertainment Robot Market Strategy, Market Shares, and Market Forecasts, 2008-2014

Educational Robot Kits Entertainment Humanoid Robots

Picture by Susan Eustis

MOUNTAINS OF OPPORTUNITY

WinterGreen Research, Inc.
Lexington, Massachusetts **www.wintergreenresearch.com**

REPORT # SH298220036 313 PAGES 116 TABLES AND FIGURES 2008 $3,300

WINTERGREEN RESEARCH, INC.

CHECK OUT THESE KEY TOPICS

ROBOT MARKET FORECASTS
ROBOT MARKET SHARES
ROBOT KITS
SELF-RECONFIGURING ROBOTS
MODULAR ROBOTS
FIRST VEX
ROBO-MAGELLAN ROBOTICS
FIRST / VEX ROBOTICS
STRATEGIC POSITIONING
ROBOT TOYS
BEAM ROBOT KITS
SOLAR ROBOTS
PROGRAMMABLE ROBOT KITS
EDUCATIONAL ROBOTS
SOLDERING ROBOT KITS
ENTERTAINMENT ROBOTS
HUMANOID ROBOT

Educational Robots Provide Training

Robotic Reusable Components
ROBOTIC PLATFORMS
NEXT GENERATION ROBOTICS

OPPORTUNITY ABOUNDS

WinterGreen Research, Inc.
Lexington, Massachusetts
www.wintergreenresearch.com

REPORT # SH298220036 313 PAGES 116 TABLES AND FIGURES 2008 $3,300

WINTERGREEN RESEARCH, INC.

Educational and Entertainment Robot Market Strategy, Market Shares, and Market Forecasts, 2008-2014

The automated process revolution in educational and entertainment robots promises strong growth that extends beyond the direct markets. Once studenst learn how to use robots, they move into industry and make functional robots for business automated process and for communications and entertainment. Robots are automating systems, leaving more time for leisure activities. The educational kits are designed for pure fun and for educational competitions where students put together modules in innovative ways to create designs that work.

Robots are set to provide more variety to entertainment as well. The robotic ability to sing and dance and fight provides endless new modalities of entertainment as people organize their robots in a creative manner. Innovation is set to be stimulated by the modular systems that are available in the robotic community. Humanoid robots and innovative shaped robots are evolving a place in homes and offices, providing information and communications, as well as automated locomotion.

The modularity of robot kits makes them versatile and flexible. Modules can be put together in a variety of ways, give users choices about what functionality the robot will have.

Educational robots are used by every level of student. Kits are geared to various age and skill levels. Robotics competitions are being held for every age level. Students do not yet receive formal education on robots and are more likely to enter competitions as clubs competing against each other representing different educational institutions.

The automated process revolution in business process and communications is being extended to robots. Markets for educational robotic kits at 541,000 units in 2007 are anticipated to reach 35.8 million units by 2014.

As the price comes down and schools begin to institutionalize robotics programs, there is very fast growth anticipated. Growth at the low end robotic kits starts to level off as demand increases for robots with more components and more functionality.

Robotics transcends national boundaries. Children in Germany, Japan, Korea, India and Great Britain all are equally captivated by robotics systems.

REPORT # SH298220036 313 PAGES 116 TABLES AND FIGURES 2008 $3,300

In countries across the world, those responsible for educating the future workforce, a workforce that must compete in an internationalized economy where the science and engineering acumen of workers can mean the difference between maintaining standards of living or falling behind, robotics is rightly viewed as a key enabler and educational tool. In these countries, like the US, robotics will become a mainstay of educational curricula at all education levels.

Robotics kits are being used for education and entertainment to get students started and comfortable with the technology, programming, and concepts of robots. In some competitions, the robot must fit inside a 4'x4'x4' cube for the entire duration of its run. Robots must be autonomous. Remote control is not allowed with the exception of the remote control safety switches. Robot types include insects and animal robots, listening, touching and seeing robots, robot arms, programmable robots, educational kits, hackable robot kits, legged robot platforms and kits, and wheeled platforms.

Robotics teaches skills for every field of interest from the arts to zoology. Components are used to make a robot from a kit. Robot kits are for all ages, skills, interests and budgets. The robot must be constructive. No damage the environment or other robots is envisioned or tolerated by kit manufacturers. No kit robot weighs more than 50 pounds. Competitions do not permit use of an internal or external combustion engine.

Vendors have developed extensive robotics curriculum that is taught in high schools and colleges around the world. Vendors sell books and parts kits. They also make all the books available for free download. A robot kit gives access to a huge library of technical training and information that is specifically designed for the robot.

Many entertainment robots are available. WowWee Robopanda™ is a playful and talkative interactive friend. With his engaging personality and bright animated eyes, Robopanda™ loves to share stories and jokes, play games, sing songs and talk with children of all ages. He's a fun-filled robotic bear who can even crawl on all fours and return to a sitting position. Designed to work without a remote control, Robopanda is controlled directly by touch and sound. Users experience hours of delight and entertainment playing with him and his interactive cartridge-based content.

Markets for education al robotic kits at $27.5 million in 2007 are anticipated to reach $1.69 billion by 2014.

Robot entertainment and educational markets at $184.9 million in 2007 are anticipated to reach $2.985 billion by 2014. Market growth is spurred by the evolution of a new technology useful in a range of industry segments. The educational and entertainment robots represent a first step in the evolution of the robotic markets because they provide the teaching aspect of the market that precedes any other market evolution in the services and mobility segments of consumer robotics.

Companies Profiled

Market Leaders

Educational and Entertainment Robots

Innovation First
Lego
Electromechanica
Evolution Robotics
Hitachi
Fischertechnik
Microsoft
Ugobe
Honda
Toyota

Market Participants

Anybots
Draganfly Innovations
EH Publishing / Robotics Trends
QinetiQ North America / FosterMiller / Automatika / Applied5- Perception
Gostai SAS
Idealab / Evolution Robotics
Innova Holdings / CoroWare
Innovation First Robotics / VexRobotics
IntelliVision
Innovative Robotics
Object Management Group OMG
Optimal Group / WowWee
Robotics Trends
Sensory
SRI International
ComCam
Systronix
Fujitsu
VA Technologies
Trossen Robotics
SuperDroid Robots Inc
iRobot
NeuroSky
OLogic
Parallax
Rogue Robotics
SJAutomation

REPORT # SH298220036 313 PAGES 116 TABLES AND FIGURES 2008 $3,300

WINTERGREEN RESEARCH, INC.

Educational and Entertainment Robots Market Strategy, Market Shares, and Market Forecasts, 2008-2014

REPORT METHODOLOGY

THIS IS THE 329TH REPORT IN A SERIES OF MARKET RESEARCH REPORTS THAT PROVIDE FORECASTS IN COMMUNICATIONS, TELECOMMUNICATIONS, THE INTERNET, COMPUTER, SOFTWARE, TELEPHONE EQUIPMENT, HEALTH EQUIPMENT, AND ENERGY. THE PROJECT LEADERS TAKE DIRECT RESPONSIBILITY FOR WRITING AND PREPARING EACH REPORT. THEY HAVE SIGNIFICANT EXPERIENCE PREPARING INDUSTRY STUDIES. FORECASTS ARE BASED ON PRIMARY RESEARCH AND PROPRIETARY DATA BASES. FORECASTS REFLECT ANALYSIS OF THE MARKET TRENDS IN THE SEGMENT AND RELATED SEGMENTS. UNIT AND DOLLAR SHIPMENTS ARE ANALYZED THROUGH CONSIDERATION OF DOLLAR VOLUME OF EACH MARKET PARTICIPATION IN THE SEGMENT. INSTALLED BASE ANALYSIS AND UNIT ANALYSIS IS BASED ON INTERVIEWS AND AN INFORMATION SEARCH. MARKET SHARE ANALYSIS INCLUDES CONVERSATIONS WITH KEY CUSTOMERS OF PRODUCTS, INDUSTRY SEGMENT LEADERS, MARKETING DIRECTORS, DISTRIBUTORS, LEADING MARKET PARTICIPANTS, OPINION LEADERS, AND COMPANIES SEEKING TO DEVELOP MEASURABLE MARKET SHARE. OVER 200 IN DEPTH INTERVIEWS ARE CONDUCTED FOR EACH REPORT WITH A BROAD RANGE OF KEY PARTICIPANTS AND INDUSTRY LEADERS IN THE MARKET SEGMENT. WE ESTABLISH ACCURATE MARKET FORECASTS BASED ON ECONOMIC AND MARKET CONDITIONS AS A BASE. USE INPUT/OUTPUT RATIOS, FLOW CHARTS, AND OTHER ECONOMIC METHODS TO QUANTIFY DATA. USE IN-HOUSE ANALYSTS WHO MEET STRINGENT QUALITY STANDARDS. INTERVIEWING KEY INDUSTRY PARTICIPANTS, EXPERTS AND END-USERS. OUR RESEARCH INCLUDES ACCESS TO LARGE PROPRIETARY DATABASES. LITERATURE SEARCH INCLUDES ANALYSIS OF TRADE PUBLICATIONS, GOVERNMENT REPORTS, AND CORPORATE LITERATURE.

YOU MUST HAVE THIS STUDY

REPORT # SH298220036 313 PAGES 116 TABLES AND FIGURES 2008 $3,300

Educational and Entertainment Robot Market Strategy, Market Shares, and Market Forecasts, 2008-2014

Table of Contents

EDUCATIONAL AND ENTERTAINMENT ROBOT EXECUTIVE SUMMARY

EDUCATIONAL AND ENTERTAINMENT ROBOTS EXECUTIVE SUMMARY **ES-1**
Educational and Entertainment Robot Market Driving Forces ES-1
Educational Robot Market Shares ES-5
Worldwide Robot Kits Market Forecasts ES-7

EDUCATIONAL AND ENTERTAINMENT ROBOT MARKET DESCRIPTION AND MARKET DYNAMICS

1. EDUCATIONAL AND ENTERTAINMENT ROBOT MARKET DESCRIPTION AND MARKET DYNAMICS1-1
1.1 Robot Kits 1-1
1.1.1 Modular Self-Reconfiguring Robotic Systems 1-3
1.1.2 Design, Development and Standards Track 1-4
1.1.3 Tools and Platforms Track 1-6
1.2 Enabling Technology 1-8
1.2.1 Educational Robotics Proliferate 1-10
1.2.2 Formal Incorporation Of Robotics Within School Age And University Level Curricula 1-11
1.2.3 Personal Computers Provide an Example 1-11
1.2.4 Robotics Educational Lifecycle 1-13
1.2.5 Educational Robotics Everywhere 1-13
1.3 Robotics Competitions 1-14
1.3.1 FIRST Vex Challenge 1-14
1.3.2 Robo-Magellan Robotics Competition 1-15
1.3.3 Georgia Tech Scores RoboCup 2007 for Atlanta 1-16
1.3.4 Nanogram League 1-16
1.4 Seizing the Robotics Opportunity 1-17
1.4.1 Robotic Kit Enabling Technology 1-18
1.5 Public Aware That Era Mobile Robotics Has “Arrived” 1-19
1.6 Market Research Risk Mitigation 1-20

EDUCATIONAL AND ENTERTAINMENT MARKET SHARES AND MARKET FORECASTS

2. EDUCATIONAL KIT AND ENTERTAINMENT ROBOTS MARKET SHARES AND FORECASTS 2-1
2.1 Educational and Entertainment Robot Market Driving Forces 2-1
2.2 Educational Robot Market Shares 2-5
2.2.1 Innovation First / IFIrobotics 2-8
2.2.2 First / Vex Robotics 2-8
2.2.3 Revell VEXplorer Robotics System 2-8
2.2.4 Lego Strategic Positioning 2-9
2.2.5 Lego MindStorms Robots 2-9
2.3 Educational Robot Market Forecasts 2-10
2.3.1 Educational Robot Market Dollar Forecasts 2-14
2.3.1 Toy Robot Kits 2-16
2.3.2 Basic Robot Kits Market Forecasts 2-17
2.3.3 BEAM Robot Kits 2-17
2.3.4 BEAM Solar Robot Kits 2-19

REPORT # SH298220036 313 PAGES 116 TABLES AND FIGURES 2008 $3,300

2.3.5 Programmable Robot Kits 2-19
2.3.6 Worldwide Educational Programming Robots 2-19
2.3.1 Electronics Soldering Robot Kits 2-21
2.3.2 Robot Soldering Kits 2-21
2.4 Humanoid and Entertainment Robot Market Shares 2-23
2.4.1 Ugobe's Pleo dino-bot 2-24
2.4.2 WowWee Robopanda™ Playful And Talkative Interactive 2-25
2.4.3 WowWee Next Generation Robosapien, the RS Media 2-25
2.4.4 Robosapien RS Media In Europe 2-25
2.4.5 WowWee Robosapien 2-27
2.4.6 Other Humanoid Robots 2-27
2.4.7 Toyota Robot That Plays "Pomp And Circumstance" On The Violin 2-28
2.5 Humanoid Robot Market Forecasts 2-29
2.5.1 User Programmable Robot 2-32
2.6 Educational, Humanoid, Entertainment, and Toy Robot Kit Market Regional Analysis 2-32

EDUCATIONAL AND ENTERTAINMENT ROBOT PRODUCT DESCRIPTION

3. EDUCATIONAL AND ENTERTAINMENT ROBOT PRODUCT DESCRIPTION 3-1
3.1 Robotics Design System Starter Kits 3-1
3.2 First / Vex Robotics 3-1
3.2.1 Revell VEXplorer Robotics System 3-8
3.2.2 Innovation First / Vex Power Pack 3-18
3.2.3 Innovation First / Vex Crystal Upgrade Kit (A or B) 3-18
3.2.4 Innovation First / Vex Transmitter and Receiver Kit 3-18
3.2.5 Vex Robotics Programming 3-19
3.2.6 Vex Hardware and Metal Kit 3-19
3.2.7 Vex Gear Kit 3-19
3.2.8 Vex Motor Kit 3-20
3.2.9 Vex Servo Kit 3-20
3.2.10 Vex Wheel Kit 3-20
3.2.11 Vex Tank Tread Kit 3-20
3.2.12 Vex Sprocket and Chain Kit 3-21
3.2.13 Vex Omni Directional Wheel 3-21
3.2.14 VexLabs Advanced Gear Kit 3-21
3.2.15 Vex Large Omni Directional Wheel Kit 3-22
3.2.16 Vex Limit Switch Kit 3-22
3.2.17 Vex Light Sensor Kit 3-22
3.2.18 Vex Line Tracking Kit 3-23
3.2.19 Vex Bumper Switch Kit 3-23
3.2.20 Vex Optical Shaft Encoder 3-23
3.2.21 Vex Ultrasonic Range Finder 3-23
3.2.22 Vex Safety Glasses 3-24
3.3 Microsoft Robotics Studio 3-31
3.4 LEGO MindStorms Robots 3-31
3.4.1 Lego Mindstorms NXT system 3-34
3.4.2 Built-in Rotation Sensor 3-35
3.4.3 Lego Alpha Rex 3-36
3.4.4 Lego Spike 3-39
3.4.5 Lego RoboArm T-56 3-39
3.4.6 Lego 3-40
3.4.7 Lego TriBot 3-40
3.4.8 LEGO Education 3-42
3.5 Parallax Complete Robot Kits 3-42
3.5.1 Parallax Penguin Robot (Red) 3-46
3.5.2 Parallax Boe-Bot Complete Robot 3-48
3.5.3 Parallax SumoBot Robot Competition Kit 3-52
3.5.4 Parallax Scribbler Robot 3-56

3.5.5	Parallax Toddler Full Robot Kit - Blue	3-57
3.5.6	Parallax Rogue Robotics Complete Kits	3-58
3.6	Fischertechnik Complete Robot Kits	3-59
3.7	M-TRAN Modular Transformer	3-62
3.7.1	M-TRAN	3-63
3.7.2	M-TRAN System	3-65
3.7.3	M-TRAN. Shape shifting (Self-Reconfiguration)	3-68
3.7.4	M-TRAN Locomotion Shape Shifting	3-74
3.8	Mondo-tronics OctoBot Survivor Robot Kit	3-76
3.8.1	OctoBot Survivor Robot Kit	3-76
3.9	SuperDroid	3-77
3.9.1	Autonomous All-Terrain Robot Kits	3-77
3.9.2	SuperDroid Tamiya Educational Series Robot	3-78
3.9.3	SuperDroid Vectoring Robot Kits	3-78
3.9.4	SuperDroid Modular Programmable Autonomous Robot Kits	3-78
3.9.5	SuperDroid Trekker Programmable Autonomous Robot Kits	3-78
3.9.6	SuperDroid GearMotors, Servos, and Wheels	3-79
3.9.7	SuperDroid Sensors and LCDs	3-79
3.9.8	SuperDroid Wireless Cameras	3-79
3.9.9	SuperDroid Jungle Robot Kit	3-80
3.9.10	SuperDroid Rockit Robot Kit	3-81
3.9.11	SuperDroid Weasel Robot Kit	3-81
3.9.12	SuperDroid Robots	3-82
3.9.13	SuperDroid Police Robot	3-89
3.10	OLogic Designs Technology	3-91
3.10.1	OLogic Designs Complete Robotic Systems	3-91
3.10.2	OLogic IGOR – XYZ The Robot	3-94
3.11	NeuroSky	3-100
3.11.1	NeuroSky ThinkGearTM Module With Dry-Active Sensor	3-100
3.11.2	NeuroSky ThinkGearTM Module eSenseTM Algorithm Library	3-101
3.11.3	NeuroSky Prototype	3-102
3.12	Solarbotics B.E.A.M. Robotics	3-103
3.13	Segway	3-105
3.14	Ugobe's Pleo dino-bot	3-106
3.14.1	Organic Robotics Technology and Behaviors Breathes Life into Robotics	3-107
3.15	Wow Wee Robosapien	3-110
3.15.1	Robosapien:	3-110
3.15.2	WowWee Robopanda™ Playful And Talkative Interactive	3-115
3.15.3	WowWee Roboquad	3-117
3.15.4	Wow Wee Robotics	3-119
3.16	Honda ASIMO	3-120
3.17	VIA Robotics	3-120
3.17.1	VIA Open Systems Robotics Development Platform	3-122
3.18	Toyota	3-122
3.19	Hitachi	3-125
3.20	China's Third Generation Of Intelligent Robots	3-127
3.20.1	Robots Serve Customers In Restaurant	3-129
3.20.2	Chinese Robots Can "Wink" And "Draw	3-131
3.21	1st “Robot Bird” Completed In Qingdao	3-132
3.22	Robotis / Bioloid Bipedal Robot Construction Kit	3-133
3.22.1	Bioloid Motion Editor	3-136
3.22.2	Hitec/Robonova-1	3-139
3.23	HiTec RoboNova-1	3-141
3.24	TAEJON_D2E Robotics	3-141

EDUCATIONAL AND ENTERTAINMENT ROBOT STRATEGY, TECHNOLOGY, AND INDUSTRY SPECIFIC APPLICATIONS

4. EDUCATIONAL AND ENTERTAINMENT ROBOT TECHNOLOGY, AND INDUSTRY SPECIFIC APPICATIONS **4-1**

4.1 Open Robotic Control Software 4-1
4.1.1 PC-Bots 4-1
4.2 Advanced Robot Technology: Navigation, Mobility, And Manipulation 4-2
4.2.1 Robot Intelligence Systems 4-2
4.2.2 Real-World, Dynamic Sensing 4-3
4.3 User-Friendly Interfaces 4-3
4.3.1 Tightly-Integrated, Electromechanical Robot Design 4-4
4.4 Field Based Robotics Iterative Development 4-5
4.4.1 Next-Generation Products Leverage Model 4-6
4.4.2 Modular Robot Structure And Control 4-6
4.4.3 Lattice Architectures 4-7
4.4.4 Chain / Tree Architectures 4-7
4.4.5 Deterministic Reconfiguration 4-7
4.4.6 Stochastic Reconfiguration 4-8
4.4.7 Modular Robotic Systems 4-8
4.5 Autonomous Modular Robotics Used in Space 4-9
4.6 Telepario 4-10
4.7 Self-Reproducing Machines 4-11
4.7.1 M-TRAN Modular Transformer 4-11
4.8 Attitude Control In Space By Control Moment Gyros 4-13
4.9 Lego Brick Construction 4-14
4.10 Robotics Government Regulations 4-15
4.11 Segway Mobile Robotic Technology 4-17
4.11.1 Segway Brains And The Brawn 4-18
4.12 Hitachi Configuration Of Robots Using The SuperH Family 4-20
4.12.1 Hitachi Concept of MMU And Logic Space 4-21

EDUCATIONAL AND ENTERTAINMENT ROBOT COMPANY PROFILES

5. EDUCATIONAL AND ENTERTAINMENT ROBOT COMPANY PROFILES **5-1**

5.1 Anybots 5-1
5.2 ComCam 5-1
5.3 Draganfly Innovations 5-2
5.4 EH Publishing / Robotics Trends 5-2
5.4.1 EH Publishing 5-3
5.5 Evolution Robotics 5-4
5.6 Electromechanica 5-4
5.7 Fischertechnik 5-4
5.8 Fujitsu 5-5
5.9 Hitachi 5-5
5.10 Honda 5-7
5.11 QinetiQ North America / FosterMiller / Automatika / Applied Perception 5-8
5.11.1 Foster-Miller 5-8
5.11.2 Automatika and Applied Perception 5-9
5.12 Gostai SAS 5-10
5.13 Idealab / Evolution Robotics 5-11
5.14 Innova Holdings / CoroWare 5-12
5.14.1 Innova Robotics & Automation / CoroWare 5-13
5.14.2 Innova Robotics and Automation 5-14
5.14.3 Innova Robotics and Automation Companies 5-14
5.14.4 Innova Robotics and Automation Alliances 5-14

REPORT # SH298220036 313 PAGES 116 TABLES AND FIGURES 2008 $3,300

5.15	Innovation First Robotics	5-15
5.15.1	Innovation First (RackSolutions) Technical Overview & Capabilities	5-16
5.15.2	Innovation First / VexRobotics	5-17
5.15.3	VexRobotics	5-17
5.15.4	Innovation First	5-18
5.15.5	Innovation First / IFIrobotics	5-19
5.15.6	Revell-Monogram LLC	5-19
5.15.7	VexRobotics	5-20
5.16	IntelliVision	5-20
5.17	iRobot	5-20
5.17.1	iRobot Strategy	5-22
5.17.2	iRobot Strategic Alliances	5-25
5.17.3	iRobot and Deere & Company	5-26
5.17.4	iRobot and Clorox Company	5-27
5.17.5	iRobot Sales and Distribution Channels	5-27
5.17.6	iRobot Revenue	5-28
5.17.7	iRobot Customer Service and Support	5-32
5.17.8	iRobot Marketing and Brand	5-32
5.18	Lego	5-37
5.18.1	LEGO Group Revenue	5-40
5.18.2	Lego Strategy	5-40
5.18.3	Lego Market And Sales Development	5-44
5.18.4	Lego Strategy Three phases	5-46
5.18.5	New Generation Of Le Go Robots, Mindstorms Nxt	5-49
5.19	Microsoft	5-50
5.19.1	Microsoft Robotics Studio Provides for Robotics Innovation	5-52
5.19.2	Key Features Of Microsoft Robotics Studio Environment	5-53
5.19.3	Microsoft Industry Partners	5-54
5.19.4	Microsoft Sponsors Carnegie Mellon Center for Innovative Robotics	5-56
5.19.5	Microsoft Robotics Studio / Via Platform	5-56
5.19.6	Microsoft Robotics Group	5-56
5.20	NeuroSky	5-57
5.21	Object Management Group OMG	5-58
5.21.1	Object Management Group Computer Industry Consortium	5-58
5.21.2	Object Management Group Technology Transfer Program	5-59
5.22	OLogic	5-60
5.23	Optimal Group / WowWee	5-60
5.23.1	Optimal Group	5-61
5.23.2	Optimal Group Variety Of Businesses	5-62
5.24	Parallax	5-62
5.25	Robotics Trends, Inc.	5-63
5.25.1	RoboDevelopment Conference Overview	5-64
5.26	Rogue Robotics	5-64
5.27	Sensory	5-65
5.28	SJAutomation	5-65
5.29	SRI International	5-65
5.30	SuperDroid Robots Inc.	5-66
5.31	Systronix	5-66
5.32	Toyota	5-66
5.33	Trossen Robotics	5-67
5.34	Ugobe	5-67
5.35	VIA Technologies	5-68
5.35.1	Via Market Challenge	5-70
5.35.2	Via Enabling New Markets	5-70
5.35.3	Via Robotics	5-71
5.35.4	Via PC-Bots	5-71
5.36	Selected List of Educational Robotics Distribution Companies	5-73

5.36.1	Selected Robotics Initiatives	5-81
5.36.2	Selected Electronics and Automotive Vendors With Robotics Programs	5-81
5.36.3	Selected Military \ Aerospace Vendors With Robotics Programs	5-82
5.36.4	Selected Toys and Entertainment With Robotics Programs	5-82
5.36.5	Selected Home Automation With Robotics Programs	5-82

List of Tables and Figures

EDUCATIONAL AND ENTERTAINMENT ROBOT EXECUTIVE SUMMARY

Table ES-1 ES-2
Robotics Kits, Modules, Parts, and Accessories
Table ES-2 ES-3
Modular Robotics Market Driving Forces
Figure ES-3 ES-6
Worldwide Educational Robotic Kit Shipments Market Shares, Dollars, 2007
Figure ES-4 ES-8
Worldwide Robot Kits Market Forecasts, Dollars, 2008-2014

EDUCATIONAL AND ENTERTAINMENT ROBOT MARKET DESCRIPTION AND MARKET DYNAMICS

Figure 1-1 1-2
Robotics Starter Kit Design System
Table 1-2 1-5
Design, Development and Standards Track Topics
Table 1-3 1-7
Tools and Platforms Track Topics
Table 1-4 1-8
Robotics Technology Elements
Table 1-5 1-12
Robotics Pattern Of Adoption

EDUCATIONAL AND ENTERTAINMENT ROBOT MARKET SHARES AND MARKET FORECASTS

Table 2-1 2-2
Robotics Kits, Modules, Parts, and Accessories
Table 2-2 2-3
Modular Robotics Market Driving Forces
Figure 2-3 2-6
Worldwide Educational Robotic Kit Shipments Market Shares, Dollars, 2007
Figure 2-4 2-7
Worldwide Educational Robotic Kit Shipments Market Shares, Dollars, 2007
Figure 2-5 2-10
Worldwide Educational Robot Market Percent Penetration, Units, 2008-2014
Figure 2-6 2-11
Worldwide Educational Robot Market Penetration Forecasts, Units, 2008-2014
Figure 2-7 2-12
Worldwide Educational Robot Kits Market Forecasts, Units Shipped, 2008-2014
Figure 2-8 2-13
Worldwide Basic Robot Kits Market Forecasts, Units, 2008-2014

Figure 2-9 2-14
Worldwide Robot Kit Market Forecasts, Dollars, 2008-2014
Figure 2-10 2-15
Worldwide Educational Robot Market Forecasts, Dollars, 2008-2014
Figure 2-11 2-17
Worldwide Basic Robot Kits Market Forecasts, Dollars, 2008-2014
Figure 2-12 2-18
Worldwide B.E.A.M. Robot Kits Market Forecasts, Dollars, 2008-2014
Figure 2-13 2-20
Worldwide Educational Programming Robot Market Forecasts, Dollars, 2008-2014
Figure 2-14 2-22
Worldwide Educational Soldering Robot Market Forecasts, Dollars, 2008-2014
Figure 2-15 2-23
Worldwide Humanoid and Entertainment Robot Shipments Market Shares, Dollars, 2007
Figure 2-16 2-24
Worldwide Humanoid and Entertainment Robot Shipments Market Shares, Dollars, 2007
Table 2-17 2-26
Robosapien Features:
Figure 2-18 2-28
Toytoa Violin Playing Robot
Figure 2-19 2-30
Worldwide Humanoid and Entertainment Robot Shipments Market Forecasts, Dollars, 2008-2014
Figure 2-20 2-31
Worldwide Humanoid and Entertainment Robot Shipments Market Forecasts, Dollars, 2008-2014
Figure 2-21 2-33
Educational and Entertainment Robot Shipments Regional Market Segments, Dollars, 2007
Figure 2-22 2-34
Worldwide Humanoid and Entertainment Robot Shipments Market Forecasts, Dollars, 2008-2014
Table 2-23 2-35
Number of Universities

EDUCATIONAL AND ENTERTAINMENT ROBOT PRODUCT DESCRIPTION

Figure 3-1 3-2
Vex Robotics Starter Kit Design System Case
Figure 3-2 3-3
Vex Robotics Design System (Starter Kit) Robotics
Table 3-3 3-4
Vex Robotics Kits, Parts. and Accessories
Table 3-4 3-6
Vex Robotics Kits, Parts and Accessories
Figure 3-5 3-7
Vex Robots
Table 3-6 3-9
Revell VEXplorer Robotics System Engineering Systems
Figure 3-7 3-10
Innovation First / Vex Spycam
Figure 3-8 3-11
Innovation First / Vex Claw Horizontal Or Vertical Mount
Figure 3-9 3-12
Innovation First / Vex Arm Servo Motors
Figure 3-10 3-13
Innovation First / Vex All Terrain Tires –

Figure 3-11 3-14
Innovation First / Vex 6-Channel Hobby-Class Transmitter –
Figure 3-12 3-16
VexLabs - Vex Robotics: 4 Motor, Dual Tank Tread Drive-Train
Figure 3-13 3-17
VexLabs - Vex Robotics Parts & Accessories 4 Motor, Dual Tank Tread Drive-Train
Table 3-14 3-24
Vex Robot Parts
Table 3-15 3-25
Vex Robotics Design System (Starter Kit) - List of Contents
Table 3-16 3-30
Vex Robotics Design System (Starter Kit) - Image of Contents
Table 3-17 3-32
LEGO MindStorms Robot Component Structures
Table 3-18 3-33
LEGO MindStorms Robot Component Functions
Figure 3-19 3-34
Lego Mindstorms NXT system
Figure 3-20 3-36
Lego Robot Built-In Rotation Sensor's Ability To Measure Distance:
Table 3-21 3-37
Lego Alpha Rex
Figure 3-22 3-38
Lego Alpha Rex
Figure 3-23 3-40
Lego RoboArm T-56
Table 3-24 3-41
Lego TriBot
Table 3-25 3-43
Parallax Product Features
Table 3-26 3-44
Parallax Robots
Figure 3-27 3-45
Parallax Penguin Robot Kit
Table 3-28 3-47
Parallax Penguin Features:
Table 3-29 3-49
Parallax Boe-Bot Robot's Flexibility Features
Figure 3-30 3-50
Parallax Boe-Bot
Figure 3-31 3-54
Parallax SumoBot Robot Kit
Figure 3-32 3-55
Parallax Robot Kit
Table 3-33 3-56
Parallax SumoBot Robot Kit Design Specifications:
Figure 3-34 3-60
Fischertechnik Bionic Robots Building Set
Figure 3-35 3-63
M-TRAN (Modular Transformer)
Table 3-36 3-64
M-TRAN (Modular Transformer) Shapes

Table 3-37 3-66
M-TRAN System Functions
Figure 3-38 3-67
M-TRAN Two Module Connection Varieties
Figure 3-39 3-68
M-TRAN Lattice Structure and Robotic Motions
Figure 3-40 3-69
M-TRAN. Shape shifting (Self-Reconfiguration)
Figure 3-41 3-71
M-TRAN Locomotion
Table 3-42 3-73
M-TRAN Adaptation To Environmental Changes
Figure 3-43 3-77
Mondo-tronics OctoBot Survivor Robot
Table 3-44 3-82
SuperDroid Robots Custom Engineering And Fabrication
Figure 3-45 3-84
SuperDroid Police Robot
Figure 3-46 3-85
SuperDroid All Terrain
Figure 3-47 3-87
SuperDroid Robots All Terrain Vehicle
Table 3-48 3-88
SuperDroid All Terrain Robot Customizable Functions
Table 3-49 3-89
SuperDroid All Terrain Robot Security Functions
Figure 3-50 3-90
SuperDroid Police Robot
Figure 3-51 3-92
OLogic Designs Robotic Systems Controller
Figure 3-52 3-93
OLogic Designs Robotic Systems Wheel Unit
Figure 3-53 3-94
OLogic Designs Robotic Systems Wheel and Disk
Table 3-54 3-95
OLogic IGOR Features:
Figure 3-55 3-96
OLogic Odyssey
Table 3-56 3-97
OLogic Odyssey Features:
Figure 3-57 3-98
Ologic Flexo Two-Wheeled Balancing Robot
Table 3-58 3-99
Ologic Flexo Two-Wheeled Balancing Robot Features
Table 3-59 3-101
NeuroSky ThinkGearTM Module Characteristics
Table 3-60 3-103
B.E.A.M. Robotics Functions
Table 3-61 3-104
Solarbotics B.E.A.M. Robotics Robots
Figure 3-62 3-105
Segway Personal Transporter-

Figure 3-63 3-106
Ugobe Pleo
Table 3-64 3-108
Ugobe Pleo Features
Figure 3-65 3-111
WowWee Robot Features
Figure 3-66 3-112
WowWee RobosapienV2
Figure 3-67 3-113
WowWee Robopanda
Table 3-68 3-114
WowWee Robopanda Features
Figure 3-69 3-116
WowWee Robopanda Activity Features
Table 3-70 3-118
WowWee Roboquad
Table 3-71 3-121
VIA Robotics Systems:
Table 3-72 3-123
Toyota Motor Violin Robot Performs
Figure 3-73 3-126
Hitachi EMIEW "Excellent Mobility and Interactive Existence as Workmate".
Figure 3-74 3-133
19 DOF Humanoid From Bioloid Kit
Table 3-75 3-135
Software Utilities That Come With The Bioloid kit
Table 3-76 3-137
Commands Provided With The Bioloid Behaviour Control Program
Table 3-77 3-138
Tribotix Behavior Control Program
Figure 3-78 3-139
Hitec/Robonova-1 Sensors
Figure 3-79 3-140
Hitec/Robonova-1 Robot

EDUCATIONAL AND ENTERTAINMENT ROBOT STRATEGY, TECHNOLOGY, AND INDUSTRY SPECIFIC APPLICATIONS

Figure 4-1 4-23
Hitachi Modular Robot Configuration

EDUCATIONAL AND ENTERTAINMENT ROBOT COMPANY PROFILES

Figure 5-1 5-35
iRobot Growth Positioning
Figure 5-2 5-36
iRobot Roomba Positioning
Figure 5-3 5-37
iRobot Roomba Strategy
Figure 5-4 5-63
Parallax Mission

ABOUT THE COMPANY

WINTERGREEN RESEARCH, HAS A UNIQUE RESEARCH STRATEGY THAT RELATES TO IDENTIFYING MARKET TRENDS THROUGH READING AND INTERVIEWING OPINION LEADERS. BY READING THE ELECTRONIC EQUIVALENT OF 40 FEET OF PAPER, WINTERGREEN RESEARCH SENIOR ANALYSTS CAN LEARN A LOT MORE ABOUT MARKETS, A LOT FASTER THAN CAN BE LEARNED THROUGH EXPENSIVE SURVEYS AND FOCUS GROUPS. THINKING ABOUT MARKET TRENDS IS A HIGH PRIORITY AT WINTERGREEN RESEARCH. AS WITH ALL RESEARCH, THE VALUE PROPOSITION FOR COMPETITIVE ANALYSIS COMES FROM INTELLECTUAL INPUT.

IT IS A LUXURY REALLY, AVAILABLE TO ONLY A VERY FEW PEOPLE, TO BE ABLE TO GATHER INFORMATION, LOTS OF INFORMATION FROM READING MASSIVE AMOUNTS OF CONTENT, AND THEN TRYING TO MAKE SENSE OF THAT CONTENT. THE ABILITY TO THINK ABOUT MARKET TRENDS IS ENHANCED BY DOING IT OVER AND OVER FOR MANY DIFFERENT MARKETS. THAT IS WHAT WINTERGREEN RESEARCH IS ALL ABOUT: READING AND THINKING IS AN ESSENTIAL ASPECT OF COMPETITIVE ANALYSIS. TALKING TO OPINION LEADERS IS THE THIRD ESSENTIAL ASPECT OF PRODUCING GOOD, RELIABLE DATA.

WINTERGREEN RESEARCH, FOUNDED IN 1985, PROVIDES STRATEGIC MARKET ASSESSMENTS IN TELECOMMUNICATIONS, COMMUNICATIONS EQUIPMENT, HEALTH CARE, INTERNET AND ADVANCED COMPUTER TECHNOLOGY. INDUSTRY REPORTS FOCUS ON OPPORTUNITIES THAT EXPAND EXISTING MARKETS OR DEVELOP MAJOR NEW MARKETS. THE REPORTS ASSESS NEW PRODUCT AND SERVICE POSITIONING STRATEGIES, NEW AND EVOLVING TECHNOLOGIES, AND TECHNOLOGICAL IMPACT ON PRODUCTS, SERVICES, AND MARKETS. MARKET SHARES ARE PROVIDED. LEADING MARKET PARTICIPANTS ARE PROFILED, AND THEIR MARKETING STRATEGIES, ACQUISITIONS, AND STRATEGIC ALLIANCES ARE DISCUSSED. THE PRINCIPALS OF WINTERGREEN RESEARCH HAVE BEEN INVOLVED IN ANALYSIS AND FORECASTING OF INTERNATIONAL BUSINESS OPPORTUNITIES IN TELECOMMUNICATIONS AND ADVANCED COMPUTER TECHNOLOGY MARKETS FOR OVER 30 YEARS.

ABOUT THE PRINCIPAL AUTHORS

ELLEN T. CURTISS, TECHNICAL DIRECTOR, CO-FOUNDER OF WINTERGREEN RESEARCH, CONDUCTS STRATEGIC AND MARKET ASSESSMENTS IN TECHNOLOGY-BASED INDUSTRIES. PREVIOUSLY SHE WAS A MEMBER OF THE STAFF OF ARTHUR D. LITTLE, INC., FOR 23 YEARS, MOST RECENTLY AS VICE PRESIDENT OF ARTHUR D. LITTLE DECISION RESOURCES, SPECIALIZING IN STRATEGIC PLANNING AND MARKET DEVELOPMENT SERVICES. SHE IS A GRADUATE OF BOSTON UNIVERSITY AND THE PROGRAM FOR MANAGEMENT DEVELOPMENT AT HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. SHE IS THE AUTHOR OF RECENT STUDIES ON WORLDWIDE TELECOMMUNICATIONS MARKETS, THE TOP TEN INTERNET EQUIPMENT COMPANIES, THE TOP TEN CONTRACT MANUFACTURING COMPANIES, AND THE TOP TEN TELECOMMUNICATIONS MARKET ANALYSIS AND FORECASTS.

SUSAN EUSTIS, PRESIDENT, CO-FOUNDER OF WINTERGREEN RESEARCH, HAS DONE RESEARCH IN COMMUNICATIONS AND COMPUTER MARKETS AND APPLICATIONS. SHE HOLDS SEVERAL PATENTS IN MICROCOMPUTING AND PARALLEL PROCESSING. SHE HAS THE ORIGINAL PATENTS IN ELECTRONIC VOTING MACHINES. SHE HAS NEW PATENT APPLICATIONS IN FORMAT VARYING, MULITPROCESSING, AND ELECTRONIC VOTING. SHE IS THE AUTHOR OF RECENT STUDIES OF THE REGIONAL BELL OPERATING COMPANIES' MARKETING STRATEGIES, INTERNET EQUIPMENT, BIOMETRICS, A STUDY OF INTERNET EQUIPMENT, WORLDWIDE TELECOMMUNICATIONS EQUIPMENT, TOP TEN TELECOMMUNICATIONS, DIGITAL LOOP CARRIER, WEB HOSTING, WEB SERVICES, AND APPLICATION INTEGRATION MARKETS. MS. EUSTIS IS A GRADUATE OF BARNARD COLLEGE.

WINTERGREEN RESEARCH, INC.

ORDER FORM

Return To: **WinterGreen Research, Inc.**
6 Raymond Street
Lexington, MA 02421 USA
Phone: (781) 863-5078 --- Fax: (781) 863-1235 or (781) 860-0897

PLEASE ENTER MY ORDER FOR:

Educational and Entertainment Robot Market Strategy, Market Shares, and Market Forecasts, 2008- 2014

-ALL REPORTS ARE AVAILABLE IN EITHER PRINT OR PDF-

_____PDF _____PRINT

____ENCLOSED IS MY CHECK FOR $3,300 FOR SINGLE COPY, $4,300 FOR WEB SITE POSTING

____PLEASE BILL MY COMPANY USING P.O. NUMBER_____

____PLEASE CHARGE MY MASTERCARD/VISA/AMERICAN EXPRESS—

CARD NUMBER _____EXP. DATE_____
If charging to a Credit card you may e-mail the order form, but not the card information
Fax or Call with credit card information - Do not send card number as e-mail - You may send the order as e-mail

____ADDITIONAL COPIES, @ $375 (EXTRA COPY PRICE IN EFFECT ONLY WITH INITIAL ORDER)

NAME_____TITLE_____

SIGNATURE_____

COMPANY_____DIVISION_____

ADDRESS_____

CITY_____STATE / ZIP_____

TELEPHONE_____

FAX_____

EMAIL_____

PLEASE NOTE: RESIDENTS OF MASSACHUSETTS AND CONNECTICUT MUST INCLUDE APPROPRIATE SALES TAX

SUBSCRIBERS OUTSIDE THE UNITED STATES MUST PROVIDE PREPAYMENT IN U.S. FUNDS

REPORT # SH298220036 313 PAGES 116 TABLES AND FIGURES 2008 $3,300