

2015 INFORMATION TECHNOLOGY RESEARCH REVIEW



IFT083F
January 2016

Various Analysts
Project Analyst

ISBN: 1-62296-222-2



BCC Research
49 Walnut Park, Building 2
Wellesley, MA 02481 USA
866-285-7215 (toll-free within the USA),
or (+1) 781-489-7301
www.bccresearch.com
information@bccresearch.com

TABLE OF CONTENTS

TOPIC	PAGE NO.
CHAPTER 1 FOREWORD	2
CHAPTER 2 STORAGE, TRANSFER AND ANALYSIS OF MEDICAL IMAGES: GLOBAL MARKETS (REPORT IFT114A)	4
INTRODUCTION	4
STUDY GOALS AND OBJECTIVES	4
REASONS FOR DOING THE STUDY	4
SCOPE OF REPORT	4
INTENDED AUDIENCE	4
METHODOLOGY AND INFORMATION SOURCES	5
ANALYST'S CREDENTIALS	5
RELATED BCC RESEARCH REPORTS	5
SUMMARY	5
<i>TABLE 1 GLOBAL MARKET FOR PACS, RIS AND CVIS, THROUGH 2019 (\$ MILLIONS)</i>	7
<i>FIGURE 1 GLOBAL MARKET FOR PACS, RIS AND CVIS, 2013-2019 (\$ MILLIONS)</i>	7
OVERVIEW	8
HEALTHCARE STATISTICS AND DEMOGRAPHICS	10
GLOBAL HEALTHCARE EXPENDITURE, HEALTHCARE PERSONNEL AND HOSPITAL BEDS	10
<i>TABLE 2 GLOBAL HEALTHCARE EXPENDITURE AS A PERCENTAGE OF GDP BY COUNTRY/REGION, 2012 (%)</i>	11
<i>FIGURE 2 GLOBAL HEALTHCARE EXPENDITURE AS A PERCENTAGE OF GDP BY COUNTRY/REGION, 2012 (%)</i>	11
<i>TABLE 3 NUMBER OF GLOBAL HEALTHCARE PERSONNEL BY COUNTRY/REGION, 2012 (PER 1,000 PEOPLE)</i>	12
<i>FIGURE 3 NUMBER OF GLOBAL HEALTHCARE PERSONNEL BY COUNTRY/REGION, 2012 (PER 1,000 PEOPLE)</i>	12
<i>TABLE 4 NUMBER OF HOSPITAL BEDS BY COUNTRY/REGION, 2011 (PER 1,000 PEOPLE)</i>	13
<i>FIGURE 4 NUMBER OF HOSPITAL BEDS BY COUNTRY/REGION, 2011 (PER 1,000 PEOPLE)</i>	13
DISEASE STATISTICS	13
CARDIOVASCULAR DISEASES	13
<i>TABLE 5 AGE-STANDARDIZED DEATH RATES ATTRIBUTED TO CARDIOVASCULAR DISEASES AND DIABETES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)</i>	14
<i>FIGURE 5 AGE-STANDARDIZED DEATH RATES ATTRIBUTED TO CARDIOVASCULAR DISEASES AND DIABETES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)</i>	14
CANCER	15
<i>TABLE 6 CANCER DEATH RATES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)</i>	15
<i>FIGURE 6 DEATHS DUE TO CANCER BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)</i>	15
CHRONIC RESPIRATORY DISEASES	16
<i>TABLE 7 AGE-STANDARDIZED DEATH RATES ATTRIBUTABLE TO CHRONIC RESPIRATORY DISEASES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)</i>	16
<i>FIGURE 7 AGE-STANDARDIZED DEATH RATES ATTRIBUTABLE TO CHRONIC RESPIRATORY DISEASES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)</i>	17
NEUROLOGICAL DISORDERS	17

TOPIC	PAGE NO.
<i>TABLE 8 GLOBAL PROJECTED DEATHS ATTRIBUTABLE TO NEUROLOGICAL DISORDERS, 2005-2030 (AS A PERCENTAGE OF TOTAL DEATHS)</i>	18
<i>FIGURE 8 GLOBAL PROJECTED DEATHS ATTRIBUTABLE TO NEUROLOGICAL DISORDERS, 2005-2030 (AS A PERCENTAGE OF TOTAL DEATHS)</i>	18
CHAPTER 3 SMART CITIES: GROWING NEW MARKETS FOR INFORMATION TECHNOLOGY (REPORT IFT115A)	20
INTRODUCTION	20
PURPOSE OF THIS REPORT	21
REPORT GOALS AND OBJECTIVES	21
SCOPE OF REPORT	21
INTENDED AUDIENCE	22
INFORMATION SOURCES	22
ANALYST'S CREDENTIALS	23
RELATED BCC RESEARCH REPORTS	23
EXECUTIVE SUMMARY	24
<i>TABLE 9 GLOBAL MARKET FOR SMART CITIES INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) BY REGION, THROUGH 2019 (\$ BILLIONS)</i>	25
<i>FIGURE 9 GLOBAL MARKET FOR SMART CITIES INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) BY REGION, 2013-2019 (\$ BILLIONS)</i>	25
OVERVIEW	26
THE EVOLUTION OF SUSTAINABLE DEVELOPMENT	28
SMART CITIES FRAMEWORK	30
KEY STAKEHOLDERS	32
<i>TABLE 10 SMART CITY STAKEHOLDER DESCRIPTIONS</i>	33
TECHNOLOGY SEGMENTS	34
<i>TABLE 11 TECHNOLOGIES AND CATEGORIES OF SMART CITIES ICT</i>	36
CHAPTER 4 THE GLOBAL ENTERPRISE MOBILITY MARKET (REPORT IFT119A)	38
INTRODUCTION	38
STUDY GOALS AND OBJECTIVES	38
REASONS FOR DOING THE STUDY	38
SCOPE OF REPORT	39
INTENDED AUDIENCE	39
METHODOLOGY	39
INFORMATION SOURCES	39
ANALYST'S CREDENTIALS	40
RELATED BCC RESEARCH REPORTS	40
SUMMARY	40
<i>TABLE 12 GLOBAL ENTERPRISE MOBILITY MARKET BY REGION, THROUGH 2020 (\$ BILLIONS)</i>	41
<i>FIGURE 10 GLOBAL ENTERPRISE MOBILITY MARKET BY REGION, 2014-2020 (\$ BILLIONS)</i>	41
OVERVIEW	42
EVOLUTION OF ENTERPRISE MOBILITY	43
<i>FIGURE 11 EVOLUTION OF ENTERPRISE MOBILITY TECHNOLOGIES</i>	43
FACTORS INFLUENCING DEMAND	44
RISING DEMAND FOR MOBILE DEVICES	44
INCREASED USE OF MOBILITY BY CONSUMERS AND EMPLOYEES	44

TOPIC	PAGE NO.
INCREASING ACCEPTANCE OF BYOD	45
CHALLENGES IN ENTERPRISE MOBILITY	45
SECURITY AND COMPLEXITY MAY HAMPER GROWTH OF ENTERPRISE MOBILITY INDUSTRY	45
OPPORTUNITIES FOR ENTERPRISE MOBILITY COMPANIES	46
CORE PRODUCT DEVELOPMENT	46
ADOPTING MOBILITY ENHANCES CUSTOMER SATISFACTION AND EMPLOYEE PRODUCTIVITY	46
VALUE CHAIN ANALYSIS	47
<i>FIGURE 12 ENTERPRISE MOBILITY VALUE CHAIN BY LEVEL OF IMPACT ON MARKET PARTICIPANTS</i>	48
CHAPTER 5 THE INTERNET OF THINGS (REPORT IFT118A)	50
INTRODUCTION	50
STUDY GOALS AND OBJECTIVES	50
REASONS FOR DOING THE STUDY	50
SCOPE OF REPORT	50
INTENDED AUDIENCE	52
INFORMATION SOURCES	52
ANALYST'S CREDENTIALS	52
RELATED BCC RESEARCH REPORTS	53
SUMMARY	53
<i>TABLE 13 GLOBAL MARKET FOR IOT DEVICES AND CHIPSETS, THROUGH 2020 (\$ MILLIONS)</i>	53
<i>FIGURE 13 GLOBAL MARKET FOR IOT DEVICES AND CHIPSETS, 2014-2020 (\$ MILLIONS)</i>	53
OVERVIEW	54
<i>FIGURE 14 AN IOT SYSTEM AT A GLANCE</i>	55
CHAPTER 6 COMMERCIAL BUILDING AUTOMATION PRODUCTS: TECHNOLOGIES AND GLOBAL MARKETS (REPORT IFT010D)	58
INTRODUCTION	58
STUDY GOALS AND OBJECTIVES	58
REASONS FOR DOING THE STUDY	59
SCOPE OF REPORT	60
INTENDED AUDIENCE	60
INFORMATION SOURCES	61
ANALYST'S CREDENTIALS	62
RELATED BCC RESEARCH REPORTS	62
SUMMARY	63
<i>TABLE 14 GLOBAL MARKET FOR BUILDING AUTOMATION SYSTEMS BY PRODUCT SEGMENT, THROUGH 2020 (\$ MILLIONS)</i>	64
<i>FIGURE 15 GLOBAL MARKET FOR BUILDING AUTOMATION SYSTEMS BY PRODUCT SEGMENT, 2014-2020 (\$ MILLIONS)</i>	64
OVERVIEW	65
FIVE MARKETS FOR INTEGRATED BUILDING AUTOMATION PRODUCTS	66
<i>TABLE 15 GLOBAL MARKET SHARE OF BUILDING AUTOMATION SYSTEM PRODUCTS BY CATEGORY, 2015 AND 2020 (\$ MILLIONS/%)</i>	66
<i>TABLE 16 TOP FIVE BUILDING MANAGEMENT SUPPLIERS, 2015 (\$ MILLIONS/%)</i>	67

TOPIC	PAGE NO.
COMPUTER TECHNOLOGY MAKES BUILDINGS INTELLIGENT	67
SENSORS	68
INTERNAL BACKUP AND RESTORING	69
NETWORK CONNECTIONS	69
OUTPUTS	69
INTELLIGENT BUILDINGS BECOME EASIER TO IMPLEMENT	70
WIRELESS COMMUNICATIONS AND RETROFITTING	70
NEED FOR OPEN SYSTEMS	71
TANGIBLE BENEFITS AND CAPABILITIES	71
FAST SERVICE	72
RAPID RATE OF CHANGE	72
SAVING COSTS, BUILDING VALUE	73
HURDLES TO DEPLOYMENT	73
THE NEXT BIG THING: THE INTERNET OF THINGS (IOT)	74
<i>TABLE 17 INTERNET OF THINGS ELEMENTS</i>	75
THINGS GAIN INTELLIGENCE	75
HOW DOES IT WORK?	75
DESIGN OPTIONS	76
CHANGING BUILDING DYNAMICS	77
BOOSTING MARKETING AND SALES	78
AUTOMATING BUILDING MANAGEMENT	78
FITTING THE PIECES TOGETHER	79
KEEPING INFORMATION PRIVATE	79
HACKERS BECOME SOPHISTICATED	80
SHORTER LIFE CYCLES	81
MONITORING IT SYSTEMS	81
OPEN APIS	82
A REAL COOL CAT	83
BROAD-BASED USAGE	83
BIG DATA BECOMING A BIG FORCE	84
TRADITIONAL TOOLS FAIL	84
<i>TABLE 18 THE CHANGING DATA MANAGEMENT PLATFORM</i>	85
<i>TABLE 19 THE BIG DATA ECOSYSTEM</i>	85
VOLUME, VARIETY, VELOCITY AND VARIABILITY DEFINE BIG DATA	85
MAKING THE RIGHT CONNECTION	86
HURDLES ARISE	86
MINING FOR GOLD	87
TRUTH OR DARE?	88
FINDING THE RIGHT DESIGN	88
WHAT IS HAPPENING NOW?	89
DIVING DEEPER INTO THE DATA	89
AN INCOMPLETE PICTURE	90
PARALLEL STRUCTURE	91
SPEEDING UP I/O	91
NEW INDEXING TECHNIQUES NEEDED	92
PRIVACY CONCERNS	93
AGGREGATION NEEDED	93

TOPIC	PAGE NO.
WORKING WITH LARGE DATA SETS	94
THE IMPORTANCE OF ANALYTICS	95
MAKING THE RIGHT COMBINATION	95
FINDING THE RIGHT RULE	96
CLOUD COMPUTING EMERGES AS A FORCE	97
<i>TABLE 20 CLOUD COMPUTING THROUGH THE YEARS, MID-1990S TO 2015</i>	97
<i>TABLE 21 SOFTWARE DEFINED DATA CENTERS</i>	98
THREE DIFFERENT MODELS EMERGE	98
<i>TABLE 22 CLOUD COMPUTING APPLICATIONS</i>	99
BMS MOVES TO SAAS AND IAAS	99
CLOUD HELPS SMART BUILDINGS	100
BENEFITS FOR SYSTEMS INTEGRATORS	101
IMPACT ON END-USERS	101
BMS MANUFACTURERS TO DRIVE CLOUD ADOPTION	102
VENDORS ROLL OUT CLOUD SERVICES	102
CUSTOMERS ADOPT CLOUD	103
CLOUD AND BIG DATA	104
USE WHAT YOU HAVE	104
EXAMINING ALL OPTIONS	104
LOOKING FOR A SOLUTION	105
A BIG HOLE REMAINS	105
CHINA LEADING ASIA'S BMS RISE	106
TURNING BUILDINGS GREEN	106

LIST OF TABLES

TABLE HEADING	PAGE NO.
TABLE 1 GLOBAL MARKET FOR PACS, RIS AND CVIS, THROUGH 2019 (\$ MILLIONS)	7
TABLE 2 GLOBAL HEALTHCARE EXPENDITURE AS A PERCENTAGE OF GDP BY COUNTRY/REGION, 2012 (%)	11
TABLE 3 NUMBER OF GLOBAL HEALTHCARE PERSONNEL BY COUNTRY/REGION, 2012 (PER 1,000 PEOPLE)	12
TABLE 4 NUMBER OF HOSPITAL BEDS BY COUNTRY/REGION, 2011 (PER 1,000 PEOPLE)	13
TABLE 5 AGE-STANDARDIZED DEATH RATES ATTRIBUTED TO CARDIOVASCULAR DISEASES AND DIABETES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)	14
TABLE 6 CANCER DEATH RATES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)	15
TABLE 7 AGE-STANDARDIZED DEATH RATES ATTRIBUTABLE TO CHRONIC RESPIRATORY DISEASES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)	16
TABLE 8 GLOBAL PROJECTED DEATHS ATTRIBUTABLE TO NEUROLOGICAL DISORDERS, 2005-2030 (AS A PERCENTAGE OF TOTAL DEATHS)	18
TABLE 9 GLOBAL MARKET FOR SMART CITIES INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) BY REGION, THROUGH 2019 (\$ BILLIONS)	25
TABLE 10 SMART CITY STAKEHOLDER DESCRIPTIONS	33
TABLE 11 TECHNOLOGIES AND CATEGORIES OF SMART CITIES ICT	36
TABLE 12 GLOBAL ENTERPRISE MOBILITY MARKET BY REGION, THROUGH 2020 (\$ BILLIONS)	41
TABLE 13 GLOBAL MARKET FOR IOT DEVICES AND CHIPSETS, THROUGH 2020 (\$ MILLIONS)	53
TABLE 14 GLOBAL MARKET FOR BUILDING AUTOMATION SYSTEMS BY PRODUCT SEGMENT, THROUGH 2020 (\$ MILLIONS)	64
TABLE 15 GLOBAL MARKET SHARE OF BUILDING AUTOMATION SYSTEM PRODUCTS BY CATEGORY, 2015 AND 2020 (\$ MILLIONS/%)	66
TABLE 16 TOP FIVE BUILDING MANAGEMENT SUPPLIERS, 2015 (\$ MILLIONS/%)	67
TABLE 17 INTERNET OF THINGS ELEMENTS	75
TABLE 18 THE CHANGING DATA MANAGEMENT PLATFORM	85
TABLE 19 THE BIG DATA ECOSYSTEM	85
TABLE 20 CLOUD COMPUTING THROUGH THE YEARS, MID-1990S TO 2015	97
TABLE 21 SOFTWARE DEFINED DATA CENTERS	98
TABLE 22 CLOUD COMPUTING APPLICATIONS	99

LIST OF FIGURES

FIGURE TITLE	PAGE NO.
FIGURE 1 GLOBAL MARKET FOR PACS, RIS AND CVIS, 2013-2019 (\$ MILLIONS)	7
FIGURE 2 GLOBAL HEALTHCARE EXPENDITURE AS A PERCENTAGE OF GDP BY COUNTRY/REGION, 2012 (%)	11
FIGURE 3 NUMBER OF GLOBAL HEALTHCARE PERSONNEL BY COUNTRY/REGION, 2012 (PER 1,000 PEOPLE)	12
FIGURE 4 NUMBER OF HOSPITAL BEDS BY COUNTRY/REGION, 2011 (PER 1,000 PEOPLE)	13
FIGURE 5 AGE-STANDARDIZED DEATH RATES ATTRIBUTED TO CARDIOVASCULAR DISEASES AND DIABETES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)	14
FIGURE 6 DEATHS DUE TO CANCER BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)	15
FIGURE 7 AGE-STANDARDIZED DEATH RATES ATTRIBUTABLE TO CHRONIC RESPIRATORY DISEASES BY SEX AND COUNTRY, 2008 (PER 100,000 PEOPLE)	17
FIGURE 8 GLOBAL PROJECTED DEATHS ATTRIBUTABLE TO NEUROLOGICAL DISORDERS, 2005-2030 (AS A PERCENTAGE OF TOTAL DEATHS)	18
FIGURE 9 GLOBAL MARKET FOR SMART CITIES INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) BY REGION, 2013-2019 (\$ BILLIONS)	25
FIGURE 10 GLOBAL ENTERPRISE MOBILITY MARKET BY REGION, 2014-2020 (\$ BILLIONS)	41
FIGURE 11 EVOLUTION OF ENTERPRISE MOBILITY TECHNOLOGIES	43
FIGURE 12 ENTERPRISE MOBILITY VALUE CHAIN BY LEVEL OF IMPACT ON MARKET PARTICIPANTS	48
FIGURE 13 GLOBAL MARKET FOR IOT DEVICES AND CHIPSETS, 2014-2020 (\$ MILLIONS)	53
FIGURE 14 AN IOT SYSTEM AT A GLANCE	55
FIGURE 15 GLOBAL MARKET FOR BUILDING AUTOMATION SYSTEMS BY PRODUCT SEGMENT, 2014-2020 (\$ MILLIONS)	64