



Global AI in Healthcare Market
Report: 2017-2027

December 2017

Table of Contents

Executive Summary

Key Questions Answered

1. An Introduction: Artificial Intelligence

I. Different Stages of Artificial Intelligence

II. History of Artificial Intelligence

III. Applications of Artificial Intelligence

a. Healthcare

b. Education

c. Finance

d. Law

e. Manufacturing

f. Marketing

2. Artificial Intelligence in Healthcare

I. Applications of Artificial Intelligence in Healthcare

a. Clinical Application

Drug Discovery

Robot Assisted Surgery

Virtual Nursing Assistants

Preliminary Diagnosis

Automated Image Diagnosis

b. Inpatient Care and Hospital Management

Patient Data and Risk Analysis

Precision Medicine

c. Workflow Optimization

Staff Management

3. Unmet Clinical Demand

I. Healthcare Professionals Shortage

a. Physicians

b. Nurses and Midwives

c. Other Cadres

II. Misdiagnosis

4. Impact of AI on Medical Innovation in the European Union & US

I. Current Regulation of Software in the European Union

II. European Union Regulation of Software under the New Medical Device Regulations

a. Data Protection and Cybersecurity Implications

III. Current Regulation of Software in the United States

a. Data Protection and Privacy Issues

b. Cybersecurity and Quality Control Implications

5. Artificial Intelligence Market Size

I. Global Artificial Intelligence Market

- II. Global Artificial Intelligence Market by Investment
- III. Global Artificial Intelligence Market by M&A Deals
- IV. Global Artificial Intelligence Market by Technology
- V. Global Artificial Intelligence Market by Application & Use Cases
- VI. Global Artificial Intelligence Market by Region

6. Artificial Intelligence in Healthcare Market Size

- I. Global Artificial Intelligence in Healthcare Market
- II. Global Artificial Intelligence in Healthcare Market by Application

- a. Robot-Assisted Surgery

- Top 10 Companies in Robot-assisted Surgery

- Case Study of Smart Tissue Autonomous Robot (STAR) Soft Tissue Surgery

- b. Virtual Nursing Assistants

- Sense.ly Virtual Nurse Assistance Molly & Alme Health Coach

- c. Administrative Workflow Assistant

- III. Global Artificial Intelligence in Healthcare Market by Companies

- IV. The US Artificial Intelligence in Healthcare Market

- V. Europe Artificial Intelligence in Healthcare Market

- VI. Australia Artificial Intelligence in Healthcare Market

Diabetic Retinopathy Case in Australia

VII. Japan Artificial Intelligence in Healthcare Market

7. Artificial Intelligence Investment in Healthcare

I. Investment in Crowded Imaging & Diagnostics

II. Remote Patient Monitoring

III. Core AI Companies Bring their Algorithms to Healthcare

IV. Drug Discovery

V. Virtual Assistants

VI. Mental Health

8. Artificial Intelligence Starts Up in Healthcare

9. Competitive Landscape

10. Product Analysis

I. AI Technology Platform in Healthcare Market

II. Digital Health Assistant Apps / Virtual Health Assistant in Healthcare Market

III. AI Medical Imaging Device / Software in Healthcare Market

11. Patent Landscape

I. Overall IP Trends in Artificial Intelligence in Healthcare Market

II. Artificial Intelligence in Healthcare Patent Trends by Focus Area

III. Artificial Intelligence in Healthcare Patent Trends by Application

IV. Key Patents in Artificial Intelligence in Healthcare Market

V. Artificial Intelligence in Healthcare Patent Trends by Key Players (Legal Assignees)

a. Top Collaborations of the Assignees

VI. Artificial Intelligence in Healthcare Patent Trends by Top Inventors

12. Growth Drivers

I. Accelerating Economic Growth

II. Increasing Healthcare Expenditure

III. Growth in Cloud Computing Infrastructures & Big Data

IV. Rise of Voice Commands in Assistants

V. Growing Insights-Driven Market

13. Trends

I. AI is the New User Interface

Dr. A.I.

II. Acquiring Talent Pool by M&A in AI Market

III. Rise of Open Source Artificial Intelligence Platform

Healthcare.ai

Ethereum Blockchain

14. Challenges

I. Availability of Structured and Standardized Data

II. Eating Away Jobs

III. Patient Hesitation

IV. Data Security

15. Company Profiling

I. Microsoft

- a. Business Overview
- b. Financial Overview
- c. Healthcare AI Projects

II. International Business Machines Corporation (IBM Watson)

- a. Business Overview
- b. Financial Overview
- c. AI Healthcare Projects
- d. M&A Activities / Collaborations

III. Google (DeepMind)

- a. Business Overview
- b. Financial Overview
- c. Products / Services
- d. M&A Activity / Collaborations

IV. MedyMatch Technology

- a. Business Overview
- b. Financial Overview

- c. Products / Services
- d. M&A Activity

V. iCarbonX

- a. Business Overview
- b. Financial Overview
- c. Products / Services
- d. M&A Activity

VI. Deep Genomics

- a. Business Overview
- b. Financial Overview

VII. Nvidia

- a. Business Overview
- b. Financial Overview
- c. Product Overview

VIII. Butterfly Network

- a. Business Overview
- b. Financial Overview
- c. Products / Services

IX. Flatiron Health

- a. Business Overview
- b. Financial Overview
- c. Products / Services

X. Welltok

- a. Business Overview
- b. Financial Overview
- c. Products / Services
- d. M&A Activities

XI. BenevolentAI

- a. Business Overview
- b. Financial Overview
- c. Collaborations

XII. Zephyr Health

- a. Business Overview
- b. Financial Overview
- c. Products / Services

15. About EffeMarket

Disclaimer

List of Figures

Fig 1.1 Multiple Areas Involved in Artificial Intelligence

Fig 1.2 Different Stages of Artificial Intelligence

Fig 1.3 History of Artificial Intelligence

Fig 1.4 Adoption of Artificial Intelligence by Industry

Fig 3.1 Global Health Worker Needs-based Shortages; 2013-2030

Fig 5.1 Global Artificial Intelligence Market by Value; 2014-2027

Fig 5.2 Global Artificial Intelligence Market by Investment (Disclosed Funding); 2014-2017

Fig 5.3 Global Artificial Intelligence Market by M&A Deals; 2014-2017

Fig 5.4 Global Artificial Intelligence Deals Share by Country; 2016

Fig 5.5 Global Artificial Intelligence Market by Technology; 2017

Fig 5.6 Comparison of Deep Learning Results with Human Radiologist and Conventional Computer Vision System

Fig 5.7 Global Artificial Intelligence Market by Application; 2014-2027

Fig 5.8 Top 10 Use Cases of Artificial Intelligence; 2027

Fig 5.9 Global Artificial Intelligence Market by Region; 2027

Fig 5.10 Global Artificial Intelligence Growth Rate by Region; 2015-2020

Fig 6.1 Global Artificial Intelligence in Healthcare Market by Value; 2014-2027

Fig 6.2 Global Artificial Intelligence in Healthcare Market by Application by Value; 2027

Fig 6.3 Global Artificial Intelligence in Healthcare Market by Companies; 2027

Fig 6.4 US Artificial Intelligence in Healthcare Market by Value; 2013-2027

Fig 6.5 US Artificial Intelligence in Healthcare Market by Application by Value; 2017-2020

Fig 6.6 Europe Artificial Intelligence in Healthcare Market by Value; 2016-2027

Fig 6.7 Australia Artificial Intelligence in Healthcare Market by Value; 2016-2027

Fig 6.8 Japan Artificial Intelligence in Medical & Welfare Market by Value; 2015-2027

Fig 11.1: Overall IP Trends in Artificial Intelligence in Healthcare Inhaler Market; 2012-2017

Fig 11.2: Earliest Priority Country Filing Trend in Artificial Intelligence in Healthcare Market; 2012-2017

Fig 11.3: Main Patent Focus in Artificial Intelligence in Healthcare Market; 2012-2017

Fig 11.4: Main Patent Focus in Artificial Intelligence in Healthcare Market; 2012-2017

Fig 11.5: Key Patent Holders (Legal Assignees) in Artificial Intelligence in Healthcare Market; 2017

Fig 11.6: Top Inventors in Artificial Intelligence in Healthcare Market; 2017

Fig 10.1 Global GDP; 1990-2025

Fig 10.2 Global Healthcare Expenditure; 2012-2026

Fig 10.3 Big Data Market Revenue; 2011-2017

Fig 10.4 Insights Driven Market by Value; 2015-2020

Fig 14.1 Microsoft Revenue by Products and Services; 2014-2017

Fig 14.2 Microsoft R&D Investment; 2014-2017

Fig 14.3 Microsoft Healthcare AI projects; 2017

Fig 14.4 IBM Revenue; 2012-2016

Fig 14.5 IBM R&D Investment; 2015-2016

Fig 14.6 Google Revenue; 2012-2016

Fig 14.7 Nvidia Revenue; 2013-2017

Fig 14.8 Nvidia R&D investment; 2013-2017

List of Tables

Table 6.1 Top 10 Companies in Robot-assisted Surgery

Table 8.1 Artificial Intelligence in Healthcare: Top 100 Start Ups

Table 9.1: Key Players in AI in Healthcare Market by Applications

Table 10.1: Key AI Technology Platform in Healthcare Market by Application

Table 10.2: Digital Health Assistant Apps / Virtual Health Assistant in Healthcare Market

Table 10.3: AI Medical Imaging Device / Software in Healthcare Market

Table 11.1 Artificial Intelligence in Healthcare Patent Trends by Focus Area (Year Wise Filing); 2012-2017

Table 11.2 Artificial Intelligence in Healthcare Patent Trends by Application (Year Wise Filing); 2012-2017

Table 11.3 Key Patents in Artificial Intelligence in Healthcare

Table 11.4 Key Patent Holders (Legal Assignees) Year Wise Patent Filing in Artificial Intelligence in Healthcare Market; 2012-2017

Table 11.5 Key Patent Holders (Legal Assignees) Patent Filing in Artificial Intelligence in Healthcare Market by Focus Area; 2012-2017

Table 11.6 Key Patent Holders (Legal Assignees) Patent Filing in Artificial Intelligence in Healthcare Market by Application; 2012-2017

Table 14.1 Microsoft Healthcare AI Projects

Table 14.2 IBM M&A Activities / Collaborations

Table 14.3 Google M&A Activities / Collaborations

Table 14.4 MedyMatch Technology M&A Deals

Table 14.5 iCarbonX Technology M&A Deals

Table 14.6 Butterfly iQ Product Description

Table 14.6 Welltok M&A Activities

Table 14.7 BenevolentAI Collaborations

Executive Summary

Artificial intelligence or AI a branch of science related to the development of computer systems capable of performing cognitive functions or tasks that normally require human intelligence (ability to mimic human behavior). It depends on analytical models and digital inputs in the form of enormous and incessantly flowing streams of data. The AI models speedily crunch the huge amount of data and spew out insights with an uncanny human intelligence. Some of this technology frameworks use deep learning and machine learning to create a loop of automated self-learning and uninterrupted development. Artificial intelligence driven technologies are anticipated to be the next wave of disruption to the enterprise software. Today this technology is generally known as narrow or weak AI, in which it is intended to execute a narrow task (e.g. only facial recognition or internet searches or driving a car). The state of real AI has not reached yet, however narrow AI is already present in cars, Google searches, and Amazon suggestions and in many other devices.

Artificial intelligence the smart, cognitive devices have penetrated extensively across all industries, but healthcare industry is expected to outgrow all other industries. It has been extensively used in patient care and diagnostic systems all the way from drug discovery to personalized treatment. AI in healthcare and medicine could organize patient routes or treatment plans better, and also provides healthcare professionals with literally all the information they need to make a good decision. The biggest bets are on improving patient outcomes, reducing healthcare costs and reducing time-to-market in drug discovery.

Major portion of the investment in Artificial intelligence in the healthcare industry is comprised of internal spending i.e. R&D and deployment by large high techs companies such as Apple, Google, and Amazon. Khosla Ventures and Data Collective are the top VC investors in healthcare AI startups and have backed 5 unique companies each. Total Artificial intelligence startups funded in 2016 was 550 in number and total funding value was USD5 billion, up from USD589 million in 2012. Total AI startup funding in last five years was USD12.45 billion.

The global AI market is projected to reach approximately USD139 billion by 2027 from USD8.2 billion in 2013 at a growth rate of 40 percent over the period 2017 to 2027. Advancements in image and voice recognition technology are critical to offering enhanced

drones, self-driving cars, and robotics, thus promoting the expansion of the market. Deep learning is the largest revenue segment, estimated to worth about USD8.6 billion in 2017. Systems based on deep learning are already doing better than radiologists and existing algorithms in a variety of diagnostic tasks. The use cases of Artificial intelligence that are attracting the most of the investment in 2016 are automated customer service agents, quality management investigation, and recommendation systems, diagnosis and treatment systems, fraud analysis and investigation.

Artificial intelligence in the healthcare market is a relatively new market with huge growth potential due to easier integration, will see a remarkable growth of almost 40 percent in the period span of 2017 to 2027 and is expected to reach USD50 billion by 2027. Increasing use of big data in the healthcare industry, ability of Artificial intelligence to deliver advanced care-related information to physicians to make informed decisions to personalized real-time treatment, improve patient outcomes, improve imbalance between health workforce and patients, reducing the healthcare costs and noteworthy increase in venture capital investments are anticipated to drive the Artificial intelligence in healthcare market. The main reasons for Artificial intelligence slow adoption are the high cost involved in research, the security concerns involved in opening up extensive databases, and misconceptions or errors in coming to quick conclusions. Drug discovery held over 35 percent of the global artificial intelligence market share and is anticipated to witness more than 40 percent growth rate over the period 2017-2027. The top three AI health applications that correspond to the maximum near-term value are robot-assisted surgery, virtual nursing assistants and administrative workflow assistance with market valued of USD40 billion, USD20 billion and USD18 billion respectively.

Philips is the most active assignee in the year 2017. Most of the patents of Philips during the year 2017 focus on the systems which can be used for hospital managements and in-patient care. The top priority country observed is US with a filing of 2238 patents. Preliminary diagnosis, inpatient care and hospital management are the prominent applications of AI. The top assignee is Siemens having 134 patents followed by Philips having 130 patents.

The growth of global Artificial intelligence market is directly correlated with prevailing economic conditions across the globe. The rising level of disposable income has propelled the spending trends on healthcare. In addition, the improving global economy is expected to take a step further in the years ahead and catalyzed the growth of AI in healthcare industry. The development of more

advanced and affordable cloud computing infrastructures has a huge impact on the market. Adoption of AI in healthcare is increasing due to availability of massive amounts of data due to growth of digital devices and electronic patient records. Healthcare industry is now recognizing the value of existing and new data sources and utilizing in developing actionable insights. Voice assistants and voice-enabled devices are trending these days and offer the significant advantage to increase patient engagement, improve outcomes and reduce healthcare costs.

One of the major challenges in the implementation of these technologies is lack of sufficient quantities of the high quality of structured and standardized data. Data in healthcare industry comes from different sources like electronic medical records, laboratory and imaging systems, physician notes, and health-insurance claims and in multiple formats. Security and privacy of data is one of the biggest challenge.

Key Questions Answered by the Report:

The report provides detailed market analysis of Artificial intelligence market at global and regional level, in addition to the Artificial intelligence in healthcare market. The major regions covered are the US, Europe, Japan and Australia. It also covers in detailed description of top Artificial intelligence application in the healthcare industry with market size information and case study.

1. Global Artificial intelligence market size; 2014-2027.
2. Global Artificial intelligence market by investment; 2014-2017.
3. Global Artificial intelligence market by M&A deals; 2014-2027.
4. Global Artificial intelligence M&A deals share by country; 2016.
5. Global Artificial intelligence market by technology; 2017.
6. Global Artificial intelligence market by applications; 2014-2027.
7. Global Artificial intelligence market by regions; 2027.
8. Global Artificial intelligence in healthcare market; 2014-2027.

9. Global Artificial intelligence in healthcare by application; 2014-2027.
10. Top 10 use cases of Artificial intelligence in healthcare; 2027.
11. Global Artificial intelligence in healthcare by companies; 2014-2027.
12. US Artificial intelligence in healthcare market; 2013-2027.
13. US Artificial intelligence in healthcare by application; 2017-2020.
14. Europe Artificial intelligence in healthcare market; 2016-2027.
15. Australia Artificial intelligence in healthcare market; 2016-2027.
16. Japan Artificial intelligence in medical and welfare market size; 2015-2027.
17. List of Artificial intelligence start up with their funding in healthcare market.
18. Current healthcare regulations related to software in the European Union & US.
19. Overall IP Trends in Artificial Intelligence in Healthcare Inhaler Market; 2012-2017.
20. Earliest Priority Country Filing Trend in Artificial Intelligence in Healthcare Market; 2012-2017
21. Artificial Intelligence in Healthcare Patent Trends by Focus Area; 2012-2017
22. Artificial Intelligence in Healthcare Patent Trends by Application; 2012-2017
23. Key Patents in Artificial Intelligence in Healthcare
24. Key Patent Holders in Artificial Intelligence in Healthcare Market; 2012-2017
25. Top Inventors in Artificial Intelligence in Healthcare Market; 2017
26. Top Active Inventors Associated with the Key Players in Artificial Intelligence in Healthcare Market
27. Competitive landscape of Artificial intelligence players in healthcare market.
28. Comprehensive product analysis of Artificial intelligence in healthcare market.
29. Detailed analysis of growth drivers, challenges and trends in Artificial intelligence in healthcare market.
30. Detailed company profiling of key market players: Microsoft, IBM, Google, iCarbonX, Deep Genomics, Nvidia, Butterfly Network, Flatiron Health, Welltok, BenevolentAI and Zephyr Health.

About EffeMarket

EffeMarket provides market and business research solutions to clients in over 20 industries through syndicated studies, custom research, consulting engagements and newsletters. Our experienced analyst and widespread network of experts ensures accuracy within studies and provides our patrons with extensively researched, fact-based insights that help you to take better decisions.

Disclaimer

EffeMarket reports and their contents, including all the analysis and research containing valuable market information, are provided to a select group of customers in response to orders. Our customers acknowledge when ordering that EffeMarket reports including all research and insights in their entirety are for our customers' internal use and not for general publication or disclosure to third parties. The market information is based primarily on secondary research and interviews and therefore, is subject to changes. EffeMarket takes no responsibility for any incorrect information supplied to us through such sources.

No part of this report may be given, lent, resold or disclosed to non-customers without written permission. Reproduction and/ or transmission in any form and by any means including photocopying, mechanical, electronic, recording or otherwise, without the permission of the publisher are prohibited.

Contact Us

For any questions and updates please contact:

Sales@effemarket.com

Support@effemarket.com

Website: www.effemarket.com

Phone:

US: +1-972-256-8133

UK: +44-203-286-8233

IN: +91 120 4561797

Address: Effectual Knowledge Services Pvt. Ltd. B-55, Sector 2, Noida – 201301, U.P., India

US Office – New York

Effectual Knowledge Services, Inc.
425 Broadhollow Road, Suite 427,
Melville | NY 11747

