

2016 White Paper on Information and Communications in Japan

Table of Contents

Part 1 Special Theme — IoT, Big Data, and AI: New Values Created by Networks and Data

Chapter 1

ICT-based Innovation and Economic Growth	2
Section 1 ICT Potential for Solving Issues Facing Japan, Such as the Declining Birth Rate and Aging Population	2
1. Japan's economic growth issues.....	2
2. Social and economic contributions from new forms of ICT.....	2
Section 2 ICT Contribution to Economic Growth: Specific Contribution Paths and Case Example Analysis	4
1. Systematic organization of ICT's potential contribution paths to economic growth.....	4
2. Supply-side enhancements: (1) ICT's boost to enterprise productivity.....	4
3. Supply-side enhancements: (2) ICT's role in expanding labor participation and improving labor force quality.....	6
4. Demand-side enhancements: (3) Creating demand with new goods and services.....	7
5. Demand-side enhancements: (4) Capturing global demand.....	10
Section 3 ICT Contribution to Economic Growth: Quantitative and Comprehensive Verification	15
1. ICT contributions to economic growth.....	15
2. Suggestions taken from the verification results.....	16
Section 4 Multifaceted ICT Contribution to the Economy and Society	17
1. Diversity of ICT social and economic contributions.....	17
2. Non-monetary social and economic changes brought by ICT.....	17
3. Future social and economic prospects brought on by ICT progress.....	19

Chapter 2

Analysis of ICT Industrial Trends in the IoT Era	20
Section 1 Current Status of the ICT Industry and Its Structural Reorganization	20
1. Growth in things connected to the Internet.....	20
2. Growth in data traffic.....	20
3. Creation of new markets and business model transformations.....	20
Section 2 Quantitative Verification of the Market Size, etc.	20
1. Platforms.....	20
2. Networks.....	21
Section 3 IoT Progress In and Outside Japan	22
1. IoT expansion efforts domestically and abroad.....	22
2. IoT adoption by enterprises.....	22
3. International comparison of IoT initiatives by enterprises.....	23

Chapter 3

New Products and Services in the IoT Era	26
Section 1 New Services in the IoT Era	26
1. FinTech.....	26
2. Sharing economy.....	28
Section 2 Smartphone Penetration and ICT Use and Application	31
1. Usage rates of major ICT devices and services.....	31
2. Distinctive media use in the age of widespread smartphone adoption.....	31
Section 3 ICT Use and Application in the Public Sector	32
1. Medical and healthcare sector.....	32
2. Education sector.....	35
3. Crime prevention sector.....	36
4. Disaster and accident mitigation sector.....	36
Section 4 Japanese Culture and ICT in the Eyes of Foreign Nationals	38
1. Japan's ICT and culture as seen by non-Japanese.....	38

Chapter 4

ICT Progress and Future Work Styles	40
Section 1 ICT Progress and Employment	40
1. Overview of ICT's impact on employment.....	40
2. Changes in the forms of employment replaced by ICT.....	40
3. ICT and new work styles.....	40
Section 2 Present and Future of Artificial Intelligence (AI)	42
1. Progress in artificial intelligence research.....	42
2. Expanding artificial intelligence applications.....	43
Section 3 Influence of AI Progress on Employment, etc.	43
1. Artificial intelligence and employment.....	43
Section 4 Changes in the Required Skills and the Types of Human Resources and Education Sought	46
1. Facing further artificial intelligence expansion and growth.....	46
2. Future education and human resources development.....	46
3. Roles expected of government in spreading artificial intelligence.....	47

Part 2

Basic Data and Policy Directions

Chapter 5

Basic Data on the ICT Field	50
Section 1 ICT Industry Trends	50
1. Economic size of the ICT industry.....	50
2. ICT industry contributions to the national economy.....	52
3. Research and development in the ICT field.....	52
4. State of ICT enterprise operations.....	54
5. Telecommunication market trends.....	55
6. Broadcasting market trends.....	56
7. Content market trends.....	57

Section 2	ICT Service Usage Trends	61
1.	Internet usage trends	61
2.	State of telecommunication service provision and usage	66
3.	State of broadcasting service provision and usage	70
4.	Promoting ICT applications in government services	70
Section 3	Radio Spectrum Usage Trends	71
1.	State of radio spectrum usage and number of radio stations	71
2.	Radio surveillance to eliminate interference with key radio communications	71

Chapter 6

ICT Policy Directions	73	
Section 1	ICT Industry Trends	73
1.	Comprehensive Strategy Promotions	73
Section 2	Developments in Telecommunications Policy	73
1.	Developments in telecommunications policy	73
2.	Consumer affairs administration in relation to telecommunications services	74
Section 3	Developments in Radio Policy	74
1.	Promoting effective radio spectrum use	74
2.	Radio usage advancement and diversification initiatives	75
3.	Establishing radio usage environments	75
Section 4	Developments in Broadcasting Policy	76
1.	Encouraging distribution of broadcast content	76
2.	Advancements in broadcast services	76
3.	Strengthening the disaster resilience of broadcast networks	77
4.	Developing new broadcast media in vacated frequency bands	77
5.	Ensuring the safety and reliability of broadcast infrastructure	77
6.	Various issues concerning broadcasting policy	77
Section 5	Handling Disputes between Businesses in the Information and Communications Field	77
1.	Mediation and arbitration by the Telecommunications Dispute Settlement Commission	77
Section 6	Promoting ICT Use and Application	78
1.	Promoting ICT applications in education, medicine, and other fields	78
2.	Regional development using information and communications infrastructure	79
3.	Promoting the use of open data	79
4.	Promoting cyber security policy	79
5.	Establishing barrier-free information environments	80
6.	Developing ICT personnel	80
7.	Developing cloud services	80
8.	Boosting productivity with ICT	81
Section 7	Promoting ICT Research and Development	81
1.	Promoting research and development strategies	81
2.	Enhancing research and development to realize cutting-edge ICT in all parts of society	81
3.	Assistance for creating innovation using competitive funding	82
4.	Research and development programs promoting international collaborations in the ICT field	82
5.	Contributions to more resilient public infrastructure	82
6.	Other research and development programs	82
Section 8	Promoting International Strategies for ICT	83
1.	Priority promotion themes for international policy	83
2.	Initiatives in international frameworks	83
Section 9	Promoting ICT Applications in Government Services and Disaster Preparedness	84
1.	Promoting e-government	84

2. Promoting ICT applications in the disaster preparedness field.....	84
Section 10 Developments in Postal Service Administration	85
1. Promoting postal service administration.....	85
2. Promoting postal service administration in the international field.....	85
3. Promoting the correspondence delivery business.....	85