
Open Source Innovation by Open Standard and Open R&D

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AI



- Deeplearning 4j
- Caffe
- H2O
- MLib
- Apache Mahout
- OpenNN



IoT

- AllSeen(AllJoyn)
- Bug Labs
- DeviceHive
- DSA
- Eclipse IoT(Kura)
- Macchina.io

Cloud Computing



- OpenStack
- OpenShift
- CloudFoundry
- SugarCRM

Mobil

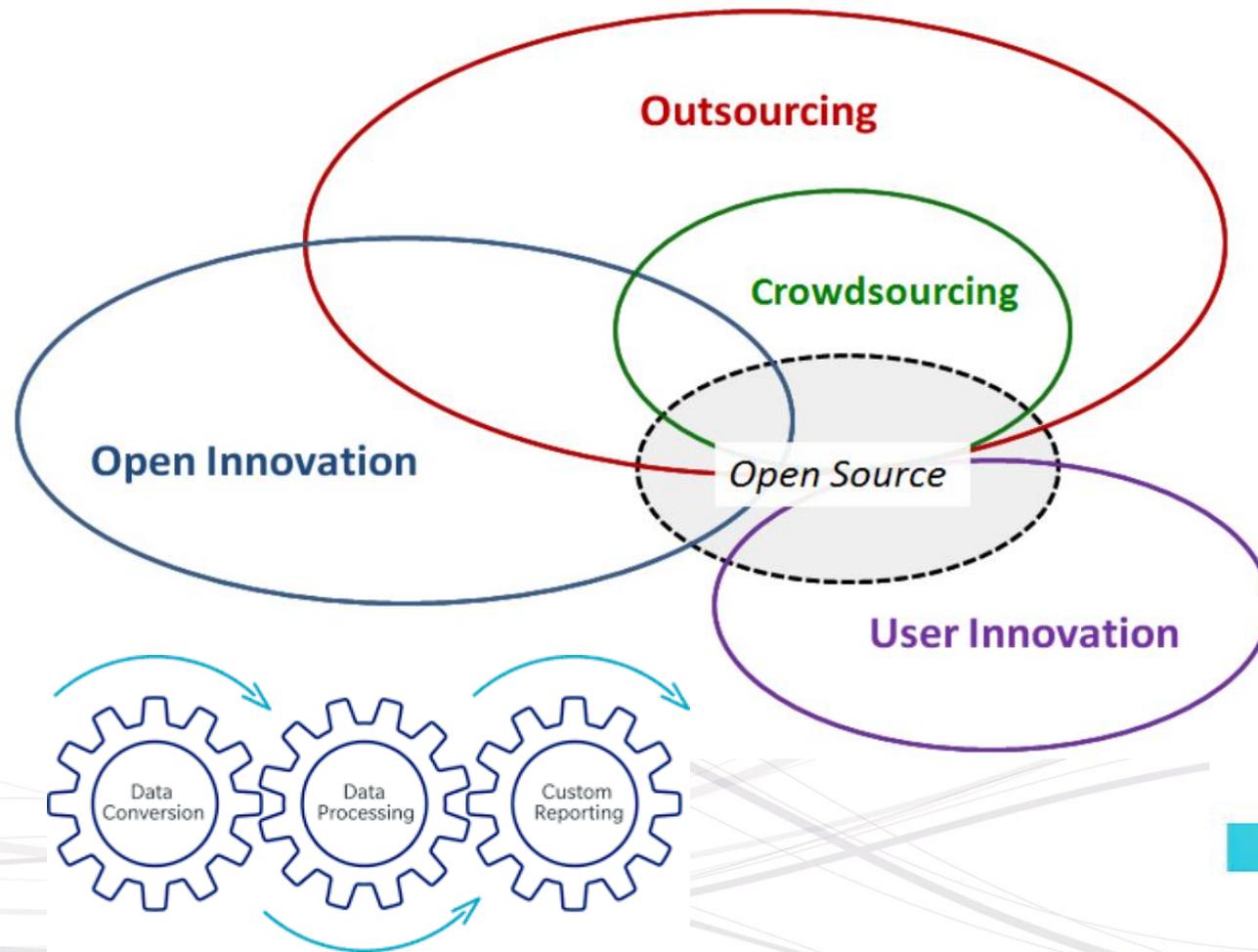


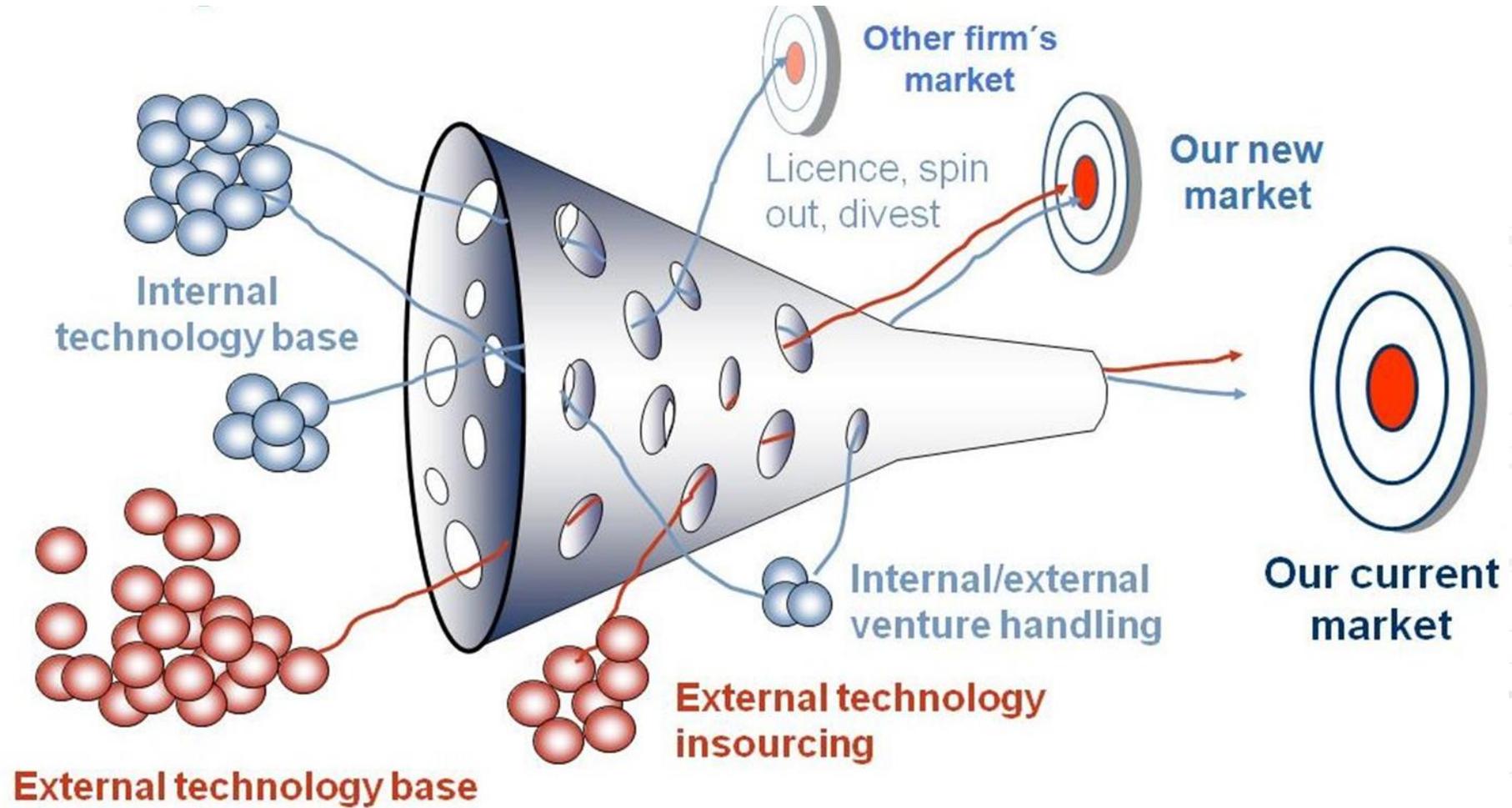
- Converigo
- ForgeRock
- OCS NG
- OpenMobster
- WSO2
- APG



Big Data

- Hadoop
- GridGain
- Cassandra
- Terrore
- Contiki
- KNIME





※ Source: Kevin Kim, Invesume 2018

Government R&D Policy of Korea

THE INTELLIGENT INFRASTRUCTURE

Big Data

Open and utilize big data

To improve the precision of big data predictive analytics, and establish a high quality big data database by 2022

As Is(2017)

- Estimated Market size: 5.7 billion USD
- Number of professional experts: 100,000
- Technology level compared to leading countries: 78.2%

To Be(2022)

- Estimated Market size: 8.0 billion USD
- Number of professional experts: 150,000
- Technology advancement compared to leading countries: 90%

Next Generation Communications

5G, IoT commercialization

Unveil and spread convergence services through commercialization of 5G and IoT hyper-connection service by 2022

As Is(2017)

- Technology Competitiveness: 5G 91.4%, IoT 81.0%
- Convergence service scenario discovery
- Number of IoT subscriptions (connected devices): approximately 10 million

To Be(2022)

- Technology Competitiveness: 5G 99.7%, IoT 85.0%
- Convergence service demonstration discovery
- Number of IoT subscriptions (connected devices): approximately 30 million

Artificial Intelligence

AI Core Technology Development

Promptly overcoming the technological gap through the development and dissemination of AI core technologies, and strengthening technological competitiveness by securing the proprietary next-generation AI technologies

As Is(2017)

- Number of AI-specialized companies: 34
- Technological competitiveness: 73.9% level of USA (2016)

To Be(2022)

- Number of AI-specialized companies: 100
- Technological competitiveness: 80% level of USA

THE SMART MOVING OBJECTS

Autonomous (Driving) Vehicles

Level 3 Autonomous Driving

Actual Road Operation of Level 3* Autonomous Vehicles and Construction of Autonomous Transport Systems by 2020

*Autonomous Driving in Certain (Stable) Areas such as Highway, and Manual Driving in Unexpected (Unstable) Situations

As Is(2017)

- Commercialization of Level 2 Autonomous Driving (Driver Assistance Functions of Lane Maintenance (Keeping), etc.)

To Be(2022)

- Commercialization of Level 3 Autonomous Driving

Drone (UAV: Unmanned Aerial Vehicle)

Public Use and Commercial UAV Supply

Technology development and commercialization of public and industrial drones.

As Is(2017)

- Domestic Commercial Drone Market Size: about 1.2 billion USD
- Technology Competitiveness: 7th (2015)
- No. of Domestic Commercial Drones: 3,500

To Be(2022)

- Domestic Commercial Drone Market Size: about 14 billion USD
- Technology Competitiveness: 6th
- No. of Domestic Commercial Drones: 28,000



CONVERGENCE SERVICES

Smart City

Solutions to Urban Problems

By 2022, a sustainable smart city platform and innovative model with intelligent technologies will be implemented to solve various urban problems.

As Is(2017)

- Manage urban infrastructures in each city using ICT

To Be(2022)

- Address various urban issues by utilizing city data

Virtual and Augmented Reality

Fusion of VR and AR with various industries

Elevating core technologies of VR/AR-fused contents/services/platforms/devices and accelerating the fusion of various industries (education, manufacturing, defense, etc.)

As Is(2017)

- 2 world-leading companies (Samsung Electronics, LG Electronics)

To Be(2022)

- Fostering more than 100 small and strong companies with over 10 million USD/year in sales

Customized Healthcare

Personalized healthcare and precision medicine

Development and implementation of personalized healthcare and precision medicine systems, and ICT-based convergent medical devices by 2022

As Is(2017)

- Partly data-based but mostly conventional healthcare services
- Seven medical devices with export sales over USD 100 million

To Be(2022)

- Implement an integrated healthcare system which is customized to individual medical records
- Develop 30 new medical devices with export potential, and 12 medical devices with export sales over USD 100 million

THE INDUSTRIAL BASE

Innovative New Drugs

Development of 100 New Drug Candidates

Development of innovative new drugs through new drug candidate discovery and non-clinical/clinical studies

As Is(2017)

- 85 new drug candidates
- Biohealth industry exports \$10 Billion

To Be(2022)

- 129 new drug candidates
- Biohealth industry exports \$13 Billion
- 30% technological improvement in pharmaceutical production system

New and Renewable Energy

Increase renewable energy portion in the total amount of electricity generation

Achieving 20% of total electricity generation by 2030

As Is(2017)

- Renewable energy 7% of gross generation (2016)

To Be(2022)

- Renewable energy 10.5% of gross generation

Intelligent Semiconductors

Development of AI Semiconductor Devices

Acquire core technologies for AI semiconductors by 2022, including ultra low-power nano-scale devices and neuromorphic chips

As Is(2017)

- Information society (system semiconductor)
- Global market share of 3%
- Fast execution, high density, functional reliability

To Be(2022)

- Intelligent Information society (intelligent semiconductor)
- Global market share of 7%
- Super-intelligence, ultra-slim-low-power, super-reliable

※ Source: Kevin Kim, Invesume 2018

Preparation & Preprocessing

Information
Collection

Case
Study

Requirement
Analysis

Modeling & Implementation

Specification
Definition

Framework
Construction

Standard Design

Standardization & Application

Official
Standardization

On-site
Application

Feedback
Reflection

Official
Amendment

Standardization in Korea

Community

Industry

Government

Standardization
& Application

Linux
Foundation

TTA
PG602

NEA OSSPF
WG3

Modeling &
Implementation

OSSEC
Kim & Chang
Lee & Ko

BDSK
Invesume
OpenWisdom

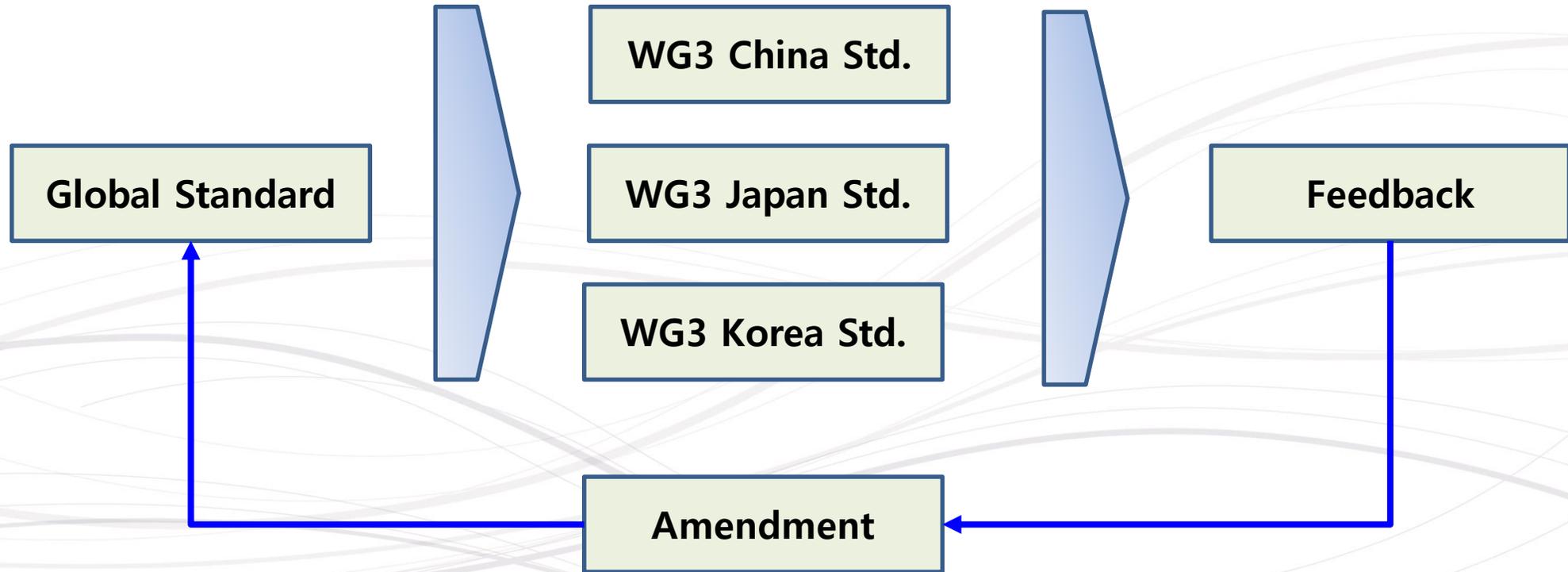
Preparation &
Preprocessing

KOSSA
KOSSPA
KOSSLC
KOSSF

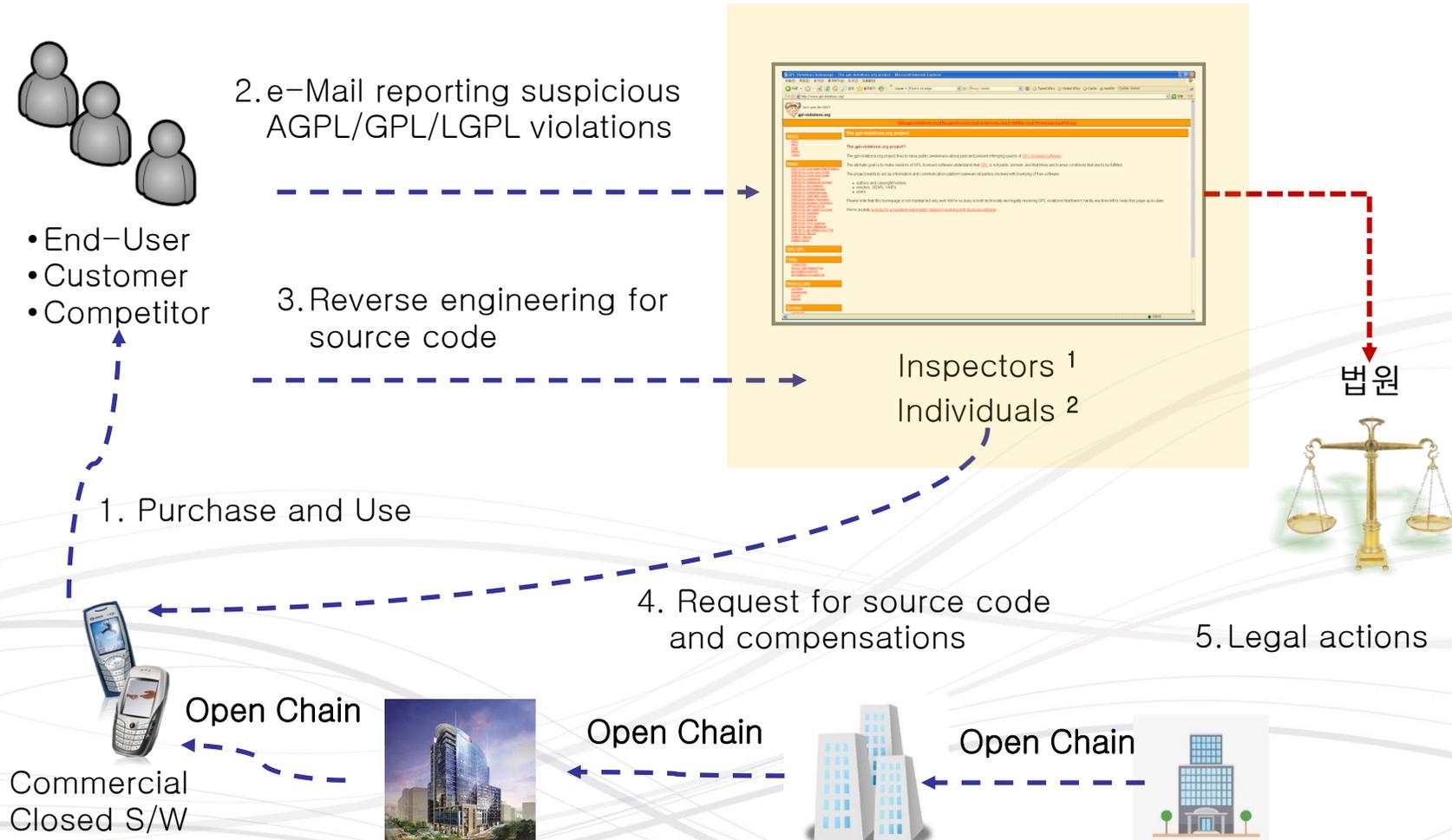
ETRI
KTDS
LG
Rock Place
SEC
SK

IITP
KCC
OSSCP

Application & Evaluation

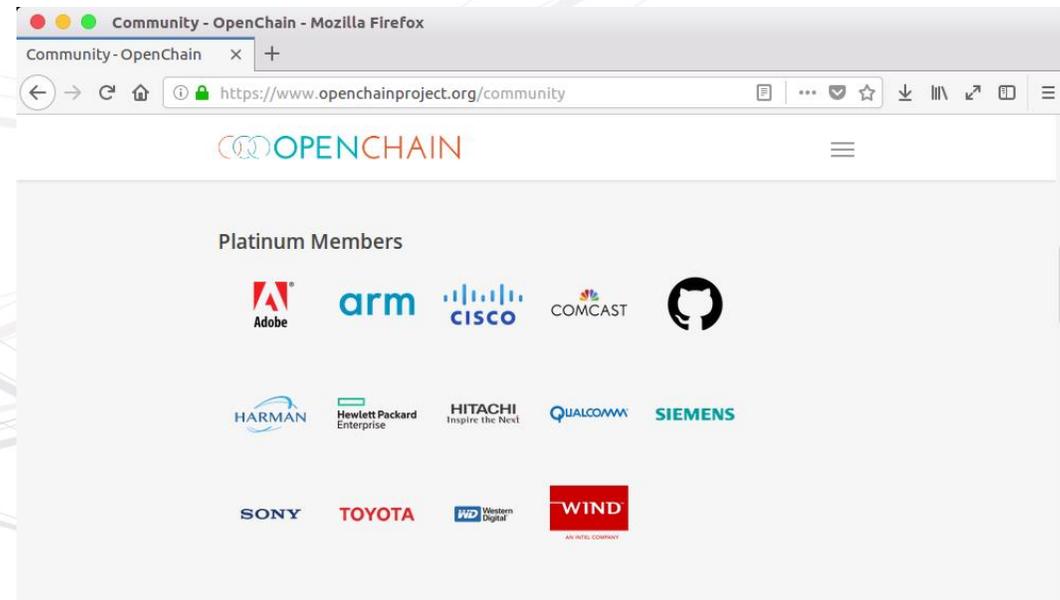


Standardization for S/W Supply Chain



1. Inspectors: FSF(Free Software Foundation), gpl-violations.org, OSC(Open Source Conservancy), SFLC(Software Freedom Law Center)
2. Individuals: Personal beneficiaries by Open Source Software copyright trials

- OpenChain is a project under the Linux Foundation, was founded in 2013 led by Qualcomm.
- The purpose is to spread OSS compliance for the software supply chain and to standardize it.
- Intellectual property department and OSS support department participate from member companies.



<https://www.openchainproject.org/>

- Proposal for License Policy Establishment Model per each business and solution



Business Model Analysis and Policy Definition

- Categorization for business model types developed for OSS usage and commercialization
- Profit Model Types and Extraction Process
- Source Code Distribution and Community Collaboration per each license



License Policy Definition / Representative License (Default License) Selection

- Establishment for License Policy based on Business model and Policy (Copy Left, Permissive, Dual License etc.)
- Representative OSS license selection process applied for projects and solutions



Candidate Group for Compatible License

- Selection and proposal process for OSS candidate group compatible with representative license



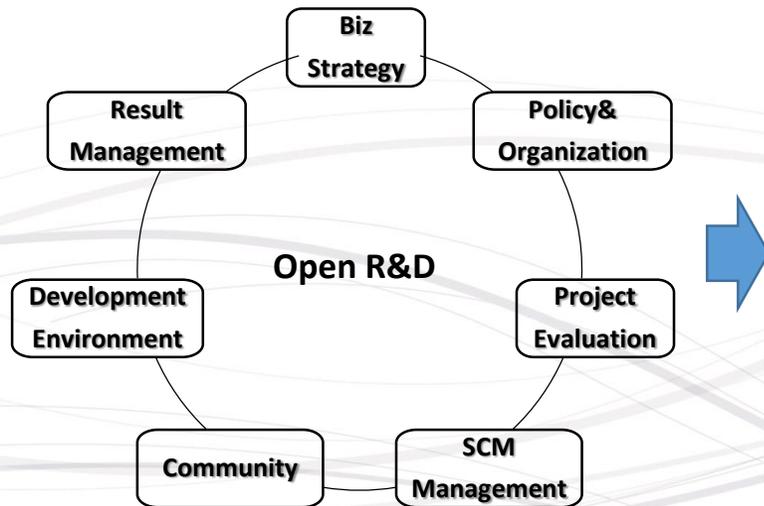
Establish and Operation of Community Compliance Policy

- Establishing process of compliance board and process for community management by OSS license policy
- Distribution of license policy and compliance guide and proposal for essential requirement



※ source: Brian Kim, BDSK 2018

- Competency Maturity Evaluation Model for OSS-based Open Innovative R&D Projects
- Urgent needs from government for managing and improving R&D activities by evaluating maturity of project execution organizations and external participants
- Composed of **capability maturity level, maturity model process applied domain, detailed grading criteria per each domain**



Phase 1 Initial	No recognition of problems. No Standard processes
Phase 2 Definition	Standard steps and formal documents Proliferation by training Compliance according to personal levels
Phase 3 Management	Monitoring compliance by formal process Examination and resolution
Phase 4 Proliferation	Enterprise level standard process Examination and resolution for organizations actions
Phase 5 Optimization	Consistent improvement Agile response for internal and external changes

※ source: Kevin Kim, Invesume 2018

Open Knowledge Management



Source Code

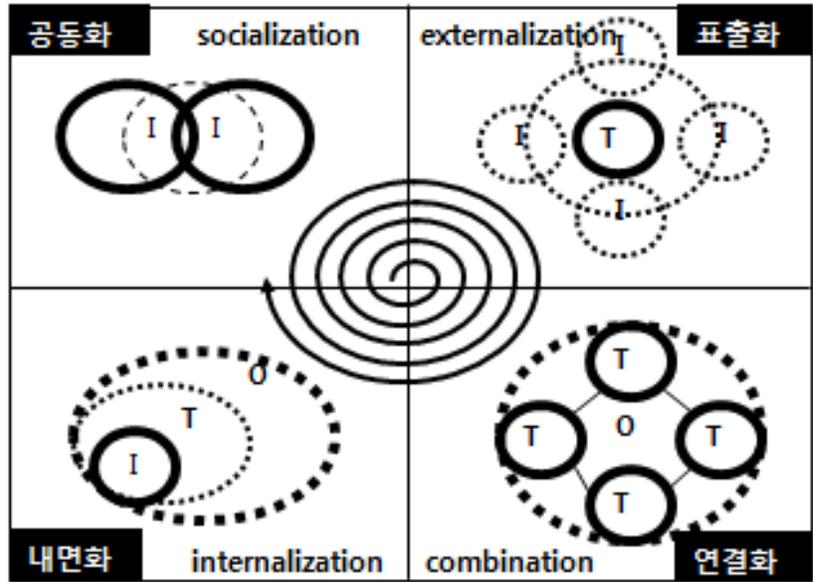
Programing



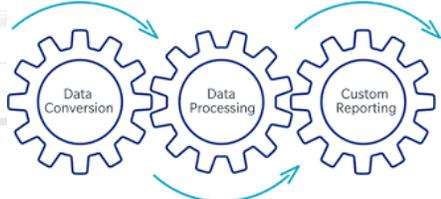
Digital Thinking

Compilation

Object Code



Distribution



Execution Code

Evaluation



Thank You

