Free/Libre Open Source Software (FLOSS) in the health care domain for its utilization in developing countries.

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Agenda

- FLOSS economy
  - For our society
- FLOSS achievements in Japan
  - Health care environment in Japan
  - ORCA project
  - Other projects

Development model of OSS for health care

- By doctors
  - Matches best for their use with low cost
  - Not so qualified codes
  - Poor activity for the others' business
- By developers
  - High quality of codes
  - Running cost for development and support
- By government
  - The most unstable! “Change!”

Problems of FLOSS on Health

- Too many stakeholders
  - Complex software
- Seller / support provider
  - “The man to be choked neck”
- Continuity
  - Who owe the cost?
- Organization
  - Mainly depend on personal activity

Economy/business

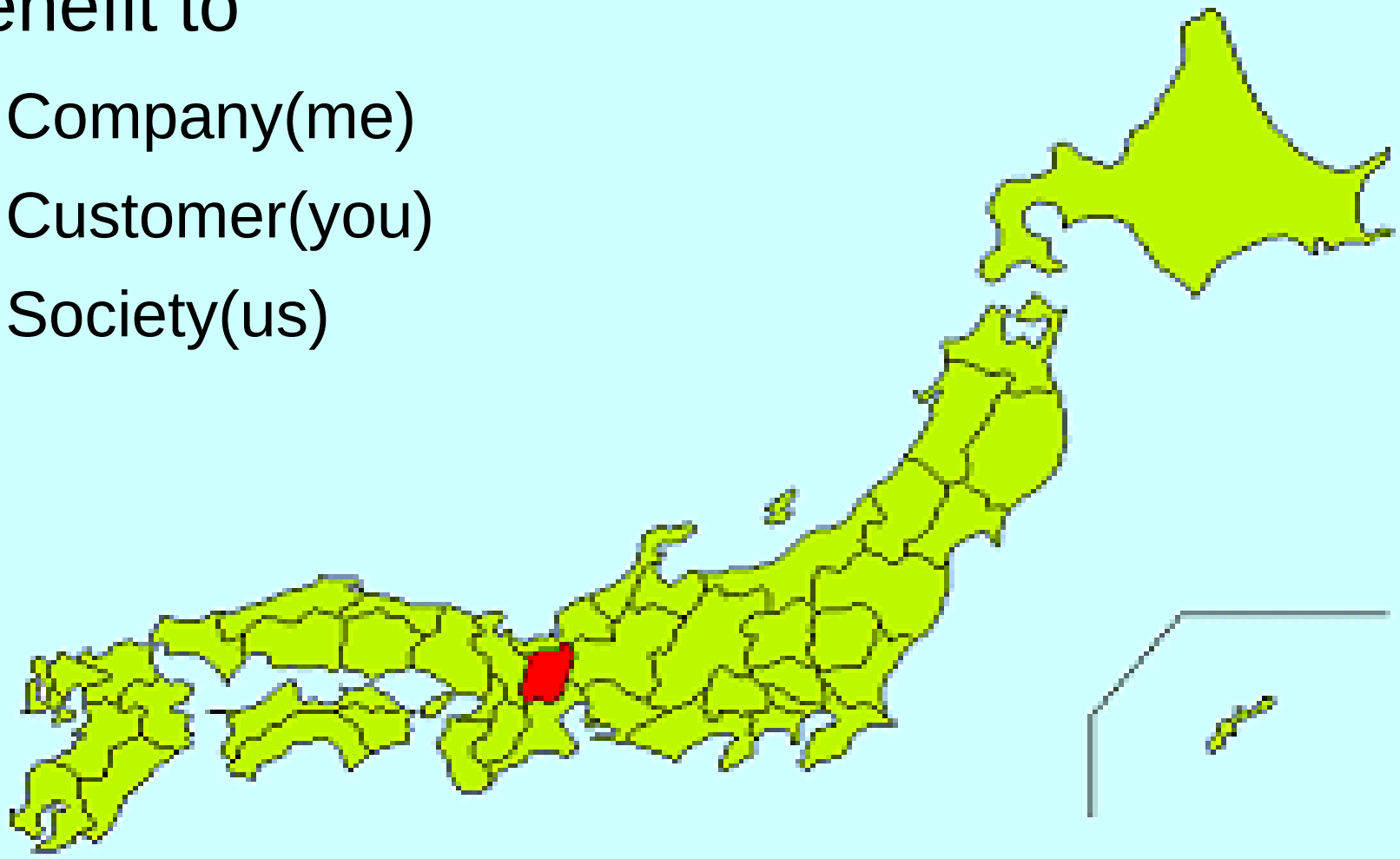
- Money is “blood”
  - Circulation makes energy
  - Stability makes coagulation/corruption
- Business continuity plan
  - Balance of reasonable cost and service
  - Logistics for supply chain, information

FLOSS business

- Volunteer and donation
- Cost for service
  - Client support for daily work
- Education and training
  - Seminar, Course ware, Publishing
  - Certification for quality
- Commercial development
  - Linux (60% of codes are from commercial company)
  - Employ OSS developer to improve it for their product/service
    - Intel, Google, Salesforce, Oracle, etc.
  - Promote their services by FLOSS

The Omi Merchants' philosophy of Triple excellence

- Benefit to
  - Company(me)
  - Customer(you)
  - Society(us)



FLOSS for health care should be..

- Benefit to
  - Developers
  - Health care providers
  - Patients and the world

Benefit for developers

- Social impact
  - Honor
  - Appreciation and appraisal
    - Especially if you are health care providers
  - Proof of skills and domain knowledge
- Economical gain
  - Not assured

Benefit for health care providers

- Ease of use
  - If they are the primary developers
- Cost reduction
  - Initial cost – yes
  - Maintenance fee – yes in case
- Freedom from 'lock-in' state
  - Utilize data on multiple purpose
- Support availability
  - Everything cannot be on line
  - Companies are rare that supports health care and expertized in FLOSS
  - Developers cannot cover all over the world

Benefit for patients and the world

- Quality of care on point
  - Not yet proved
- Reduction of total expenditure for health care
  - Promising
- Improvement of public health
  - Low deployment cost for eHealth propagation
  - Self management system
- Economical effect
  - Not assured

Summary to develop benefits

- For developers
  - Economical continuity
- For health care providers
  - Support system, vendors
- For patients and the world
  - Better than nothing, but need to prove the priority

Summary of benefits

- For developers
  - Economical continuity
- For health care providers
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FLOSS in Japan

Health care environment of Japan

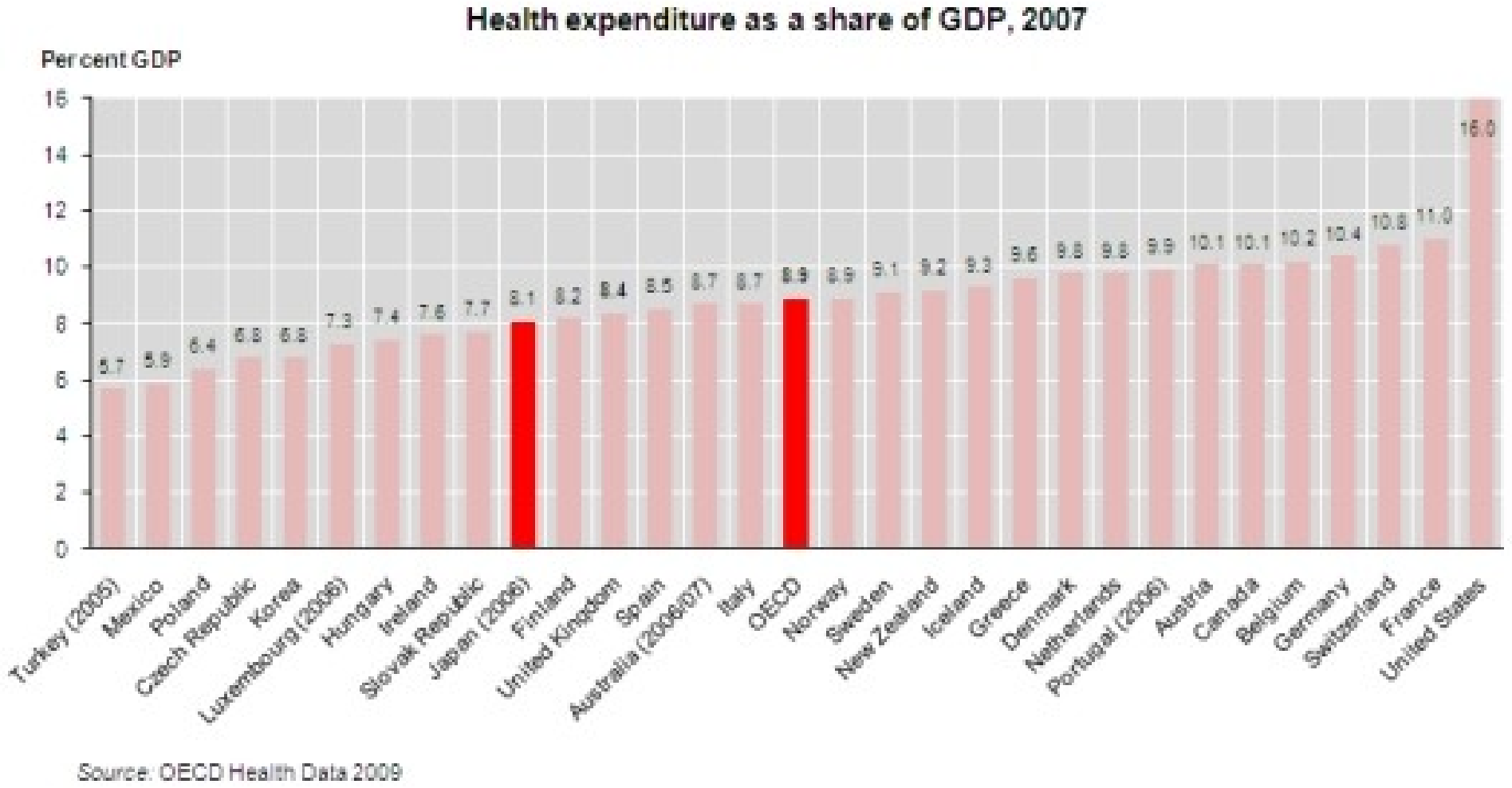
- Total health insurance system
  - To provide average level health care to all nations.
- Universal access
  - When, Where, Who, What
- High cost performance
  - Low cost
  - Longest life span
  - Minimal level maternal/infant mortality

Japanese Medical Insurance System

- From a patient and a medical perspective
  - All citizens are able to join one insurance system
  - Free access to providers and specialists
  - Fee-for-service payment
  - Providers must submit claims for processing by the 10th of the month following the visit.
  - Co-payments collected by providers each visit
  - Each prefecture and county-level government, as well as cities, towns and villages, has its own individual system of additional subsidies for medical care payments.

Average life span and infant mortality rates are among the best in the world!

Health expenditure/GDP



Source: OECD Health Data 2009

'Receipt' claim form

004096

診療報酬明細書(医科入院外) 1社 平成15年 4月分 県番27 医コ06－0[redacted]0[redacted]－6

保険 34270017

記号・番号 [redacted]

氏名 [redacted]

1 男 3 昭[redacted]7. [redacted]2. [redacted]2 生

大阪府泉大津市東雲町[redacted]－1[redacted]

八木診療所

0725－[redacted]

傷病名

(1) 高血圧症

(2) 慢性胃炎

(3) 不眠症

診療開始日

(1) 15年 4月13日

(2) 15年 4月13日

(3) 15年 4月13日

診療実日数 1日

11 初診 1回 270

13 指導 10

21 内服薬剤 42単 392

内服調剤 9× 1回 9

25 処方 × 1回 57

26 麻毒 1回 2

60 検査 4回 659

70 画像診断 1回 166

13 ＊薬剤情報提供料 10× 1

21 ＊ノルバスク錠5mg 1錠 9× 14

＊ムコスタ錠 100mg 3錠

セブンイー・P 3カプセル 10× 14

＊マイスリー錠10mg 1錠 9× 14

25 ＊特定疾患処方管理加算（処方料） 15× 1

60 ＊検 25× 1

＊末梢血液一般 27× 1

＊血液化学検査（20項目）

BIL/総, TP, BIL/直, BUN,

UA, クレアチニン, ALP, γ－GTP,

ChE, TG, K, Na及びCl, LDH,

グルコース, Amy, GOT, Tcho,

GPT, HDL－Ch, Alb 165× 1

＊B－V 12× 1

＊ECG12 150× 1

＊血液学的検査判断料 130× 1

＊生化学的検査（I）判断料 150× 1

70 ＊胸部

単純撮影（撮影） 1回

単純撮影（イ）の写真診断 1回

大角 1枚 166× 1

請求 点 1,565

13277000000000000000[redacted]

3427001706010360001565200000000000000070115045000000000000000000271112 11

- Demographics
- Insurance number
- Diagnosis
- Laboratory test/exam
  - No results
- Procedure
- Prescription
- Many local rules

'Receipt computer'

- Claiming/billing application
  - Calculate medical claim under complex rule
  - Print out 'Receipt'
- Database
  - Patients' demographics
    - Name, birthday, insurance
  - Disease, drug, procedures
- Proprietary
  - Data can be utilized for only 'Receipt' work

Problems of e-Health (in Japan)

- High cost, Low investment
  - Oligopoly market
  - Suppression to raising cost for health care
- Many standards, few implementation
  - 'Paper' standard, restriction to use
  - 'Proprietary' standards
- 'Lock in'
  - Vendor lock in → Oligopoly
  - Data lock in → lack of interoeperability
    - How many patients? Disease outcome?

OSS

- Open license, free distribution
  - Share intellectual resources
- Avoid 'lock in'
  - Health data has long life time as Human.
  - Assurance for future availability
- Drives open standard
  - Reference implementation accelerate 'OPEN' standard
- Cost reduction
  - Not aim, but result.

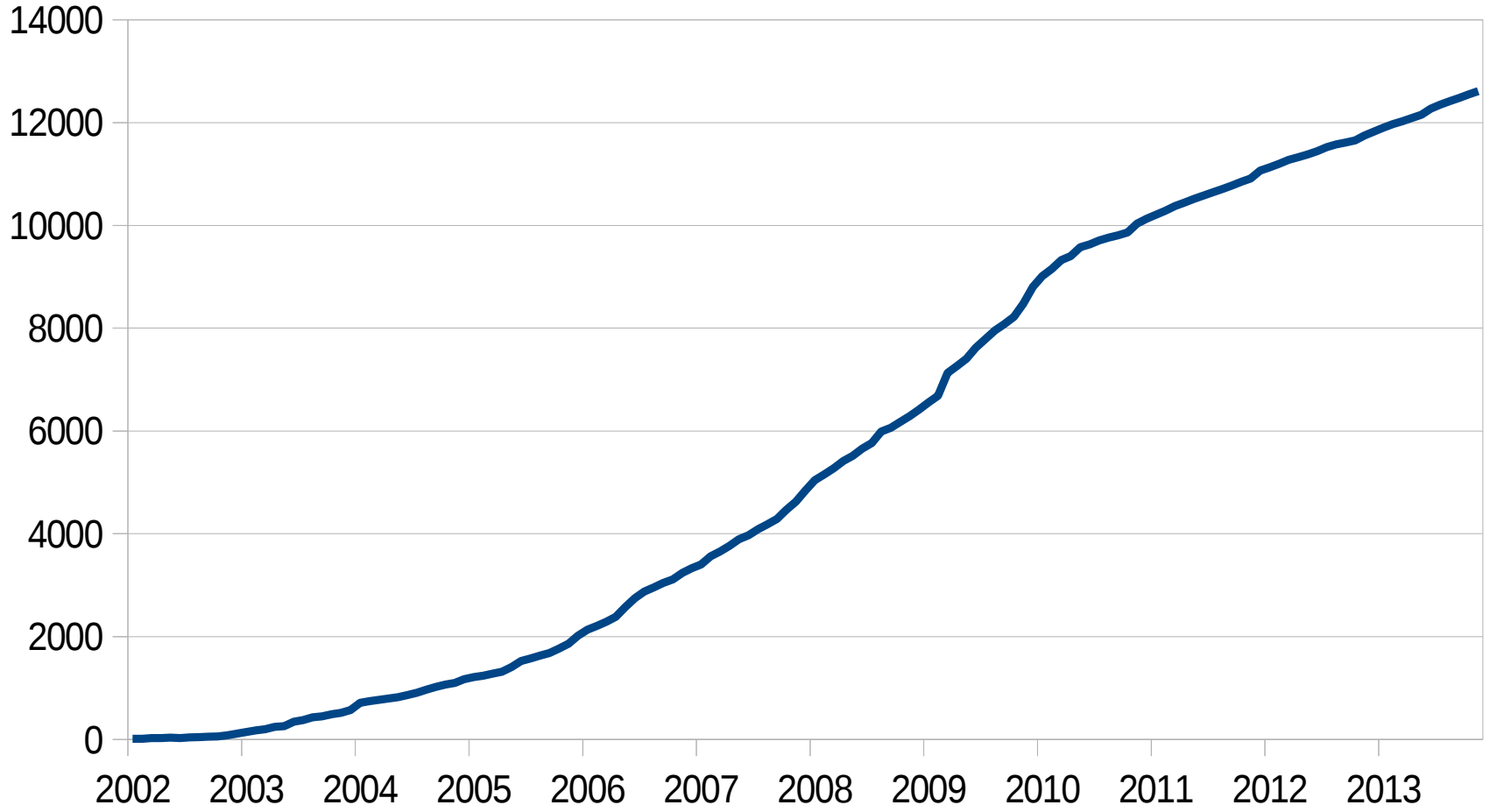
ORCA Project

- JMA Standard Receipt Computer
  - OSS, under GPL 2.0(translated into Japanese)
  - Avoid 'lock-in'
- Standard
  - Implementation based on 'de facto' standard
  - MML/CLAIM protocol ↔ EMR
- Collect data
  - Health care policy based data against meaningless government policy

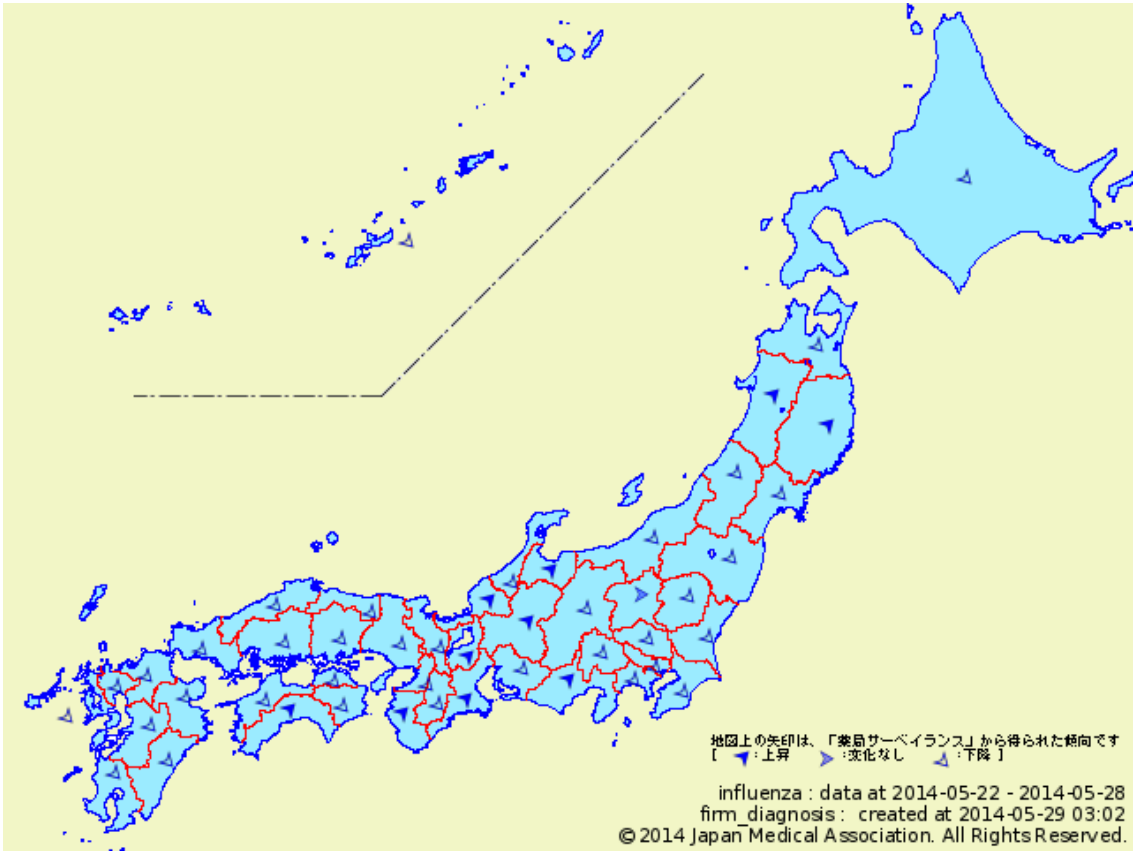
Components of JMA Standard receipt computer

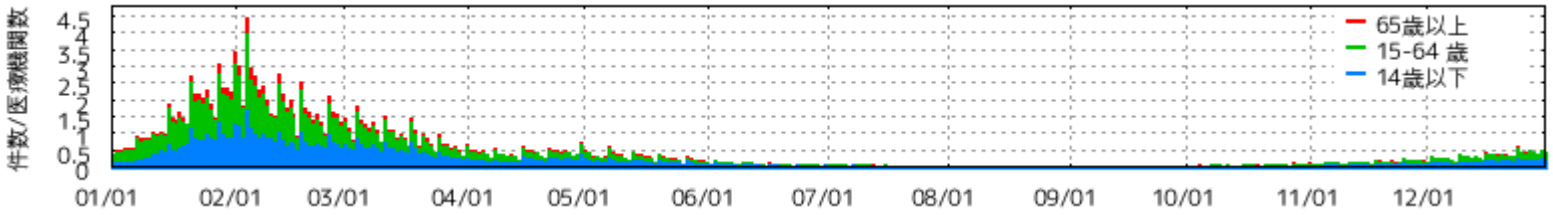
Product name	Description
PostgreSQL	Relational database management system
MONTSUQI	Transaction monitor
MONPE	Report printing environment
OpenCOBOL	COBOL language compiler
Debian GNU/Linux, Ubuntu Linux	OS environment

Adoption curve of JMA standard receipt computer



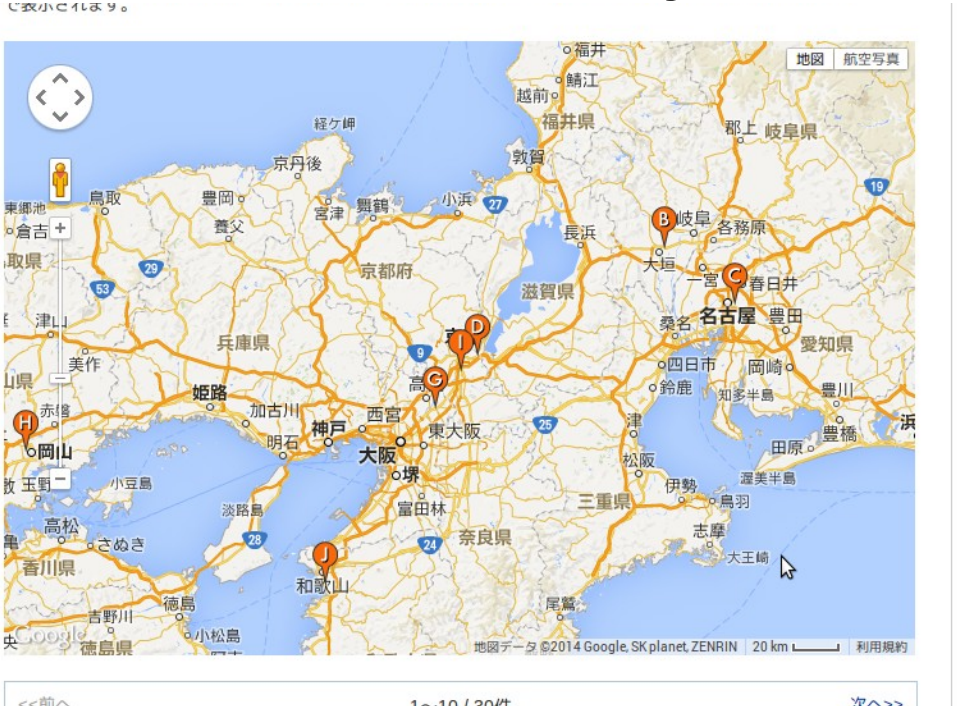
ORCA Surveillance
Influenza





Index for support vendors

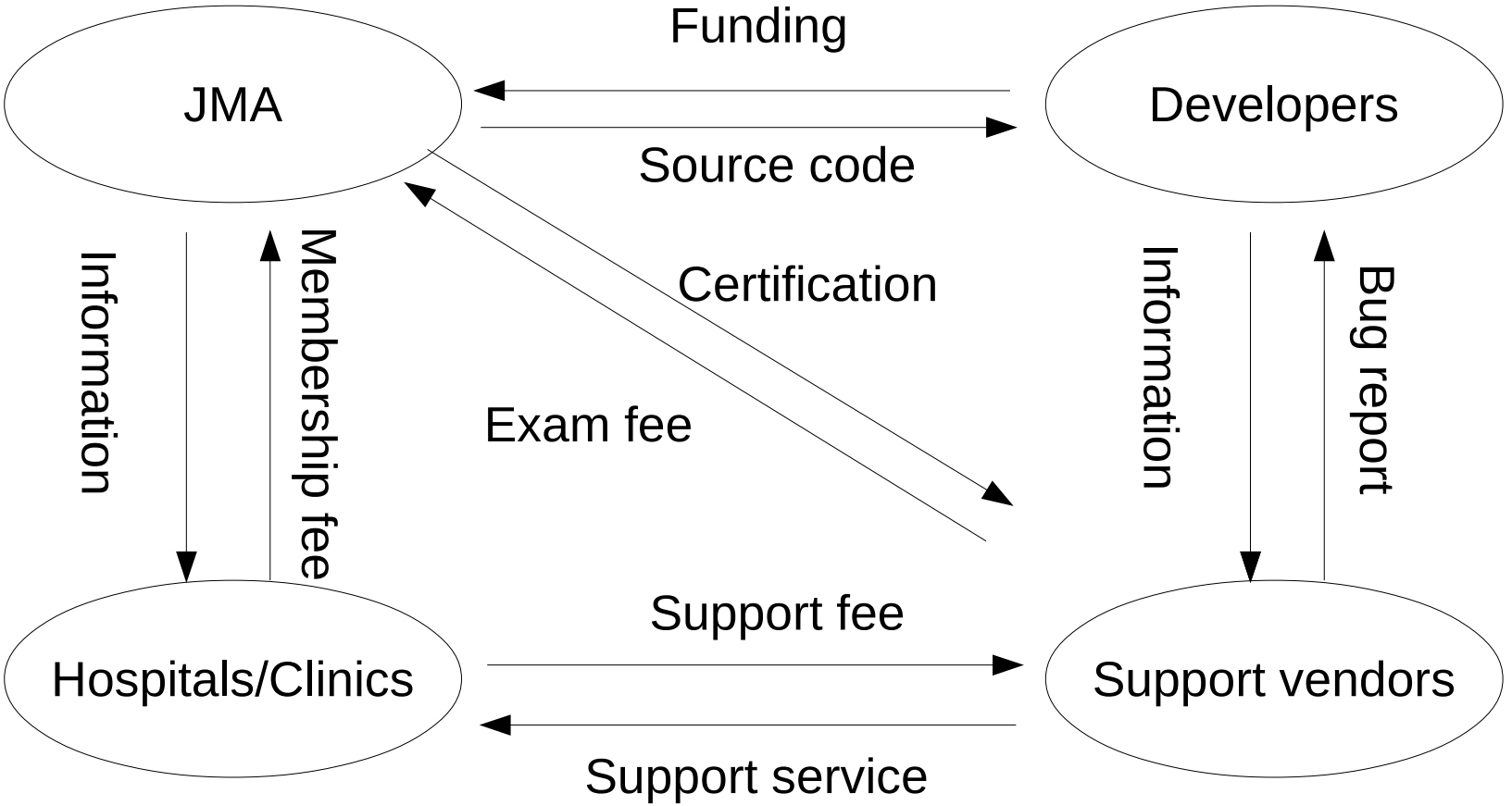
- Anyone can search authorized support vendors by many conditions in the area
- To be an authorized support vendors, it needs to pass the examination by JMA



ORCA Facts sheet

- Users
  - About 14,000 health care providers
- Codes
  - More than 1,000,000 steps
- Process
  - 1,000,000,000(1T) JPY(1M USD)/year
- Related projects
  - Long time care givers management

ORCA Ecosystem



Medical Open Source Council in Japan

- Community of FLOSS on health care
  - ORCA and other projects
    - Developers, users, support vendors, researchers
  - Introduce OSS on other domain to health care
  - Appeal FLOSS on health care to other domain
  - Launched at 2004

MOSS

Other Medical FLOSS in Japan

- NOA
  - EHR by 68 y.o. gynecologist, Dr Ohashi
- OpenDolphin
  - Primary developed as a client software of regional health organization
- ANNYYS
  - Acronym of initial developers
  - Based on FileMaker(R)

Summary of ORCA project

- JMA has promoted
  - Health care providers themselves have investigated for their use of data.
- Support vendors are necessary
  - Only developers cannot cover nation wide support
  - Qualification system has worked well
- Government was none of use
  - Political matters are the pile of instability

Suggestion to developing country to adopt FLOSS on health care

- Make continual business model
  - FLOSS business can start with small assets
- Support vendors are important
  - Local support is necessary for health care
  - Certification for quality
- Community makes happen something
  - Incubation of the next works