The Information Management System & Healthcare Smart Card Project of National Health Insurance in Taiwan

Bureau of National Health Insurance,
Department of Health, Executive Yuan, Taiwan
Feb. 4th , 2010

中央健康保險局
Bureau of National Health Insurance

Agenda

- **NHI in Taiwan**
- **Overview of NHI's Information Management Systems**
- **Medical Data Collection Method**
- **Data Warehouse System**
- **Healthcare Smart Card**

NHI in Taiwan

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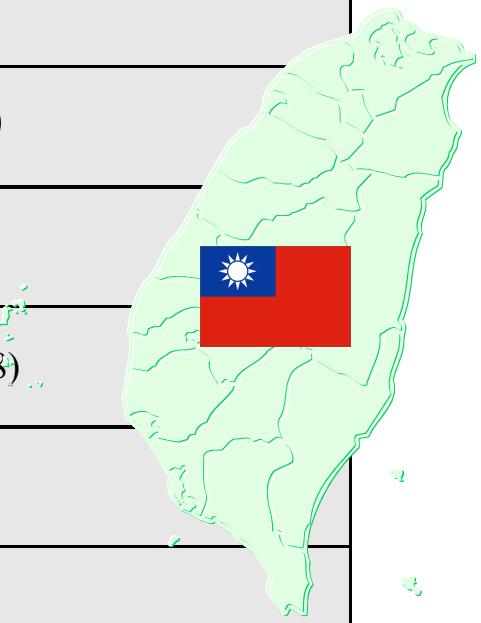
Profile of Taiwan (2009)

Population	23.1 million
Land area	35,801km^2 (13,975 sq mi)
Aging	10.63%
GDP	US$ 17,941 per capita (2008)
NHE in GDP	6.4% (2008)
Life expectancy	75.88 (M) / 82.46 (F)



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Characteristics of NHI

Coverage	Compulsory enrollment for all citizens and legal residents
Administration	Single-payer system run by the government
Financing	•Payroll-based premium •Government and employers share contribution for the insured and their dependents
Benefits	Uniformed package, copayment required
Providers	•Contract based •92% of providers contracted with NHI
Payment	Uniformed fee schedule under the global budget
Privileges	Premium and copayment subsidies for the disadvantaged

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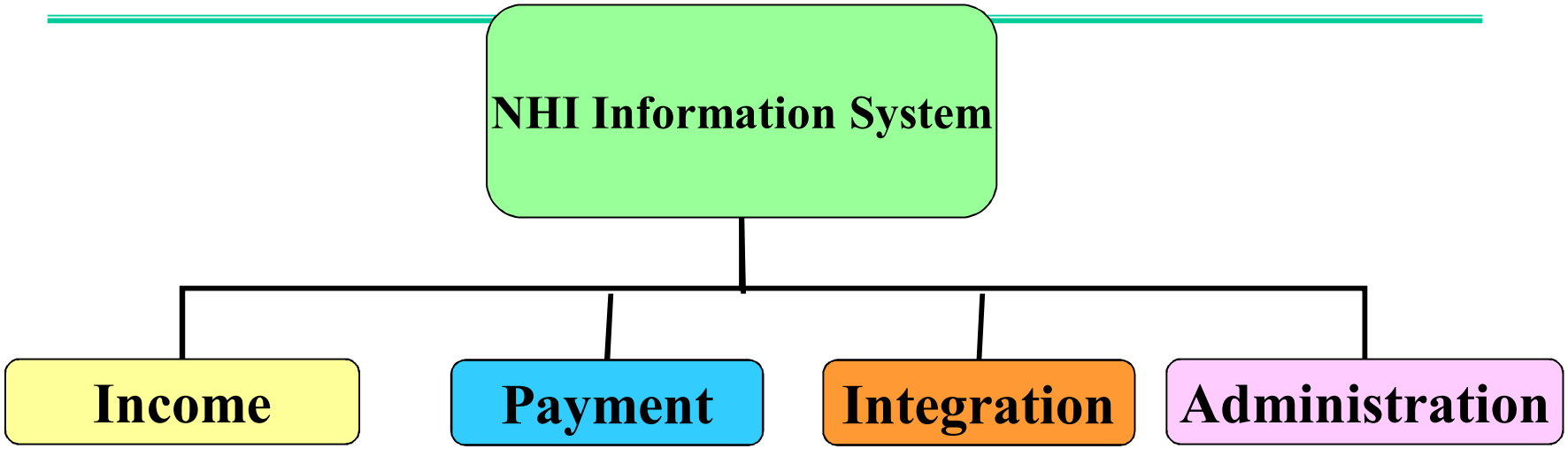
Overview of NHI's Information Systems

Information Systems of NHI



- Underwriting
- Financial management
- Community Insurance
- On-line enrollment data exchange system

- Medical affairs
- Fee schedule
- Medical payment
- Global budget monitoring
- Profile analysis

- Data warehouse system
- Smart card system

- Human resource
- Office automation
- IT request management
- Official document management

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Data Profile

- THE NUMBER OF GROUP INSURANCE APPLICANTS：more than 700,000
- THE NUMBER OF BENEFICIARIES：23 million
  the rate of transactions per month：8%-10%
- THE NUMBER OF CLAIMS FOR OUTPATIENT TREATMENT PER MONTH：28 million
  the number of medical orders per month ：
  more than 116 million
- THE NUMBER OF CLAIMS FOR INPATIENT TREATMENT PER MONTH：257,000
  the number of medical orders per month ： 16 million
- THE NUMBER OF PHARMACY CLAIMS PER MONTH：5 million
  the number of prescription records per month ：
  more than 16 million

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NHI Data Flow

Public

Enrollment
&
Premium

Health
Care

Claim data & medical data

Reimbursement

BNHI

Hospital
Clinics

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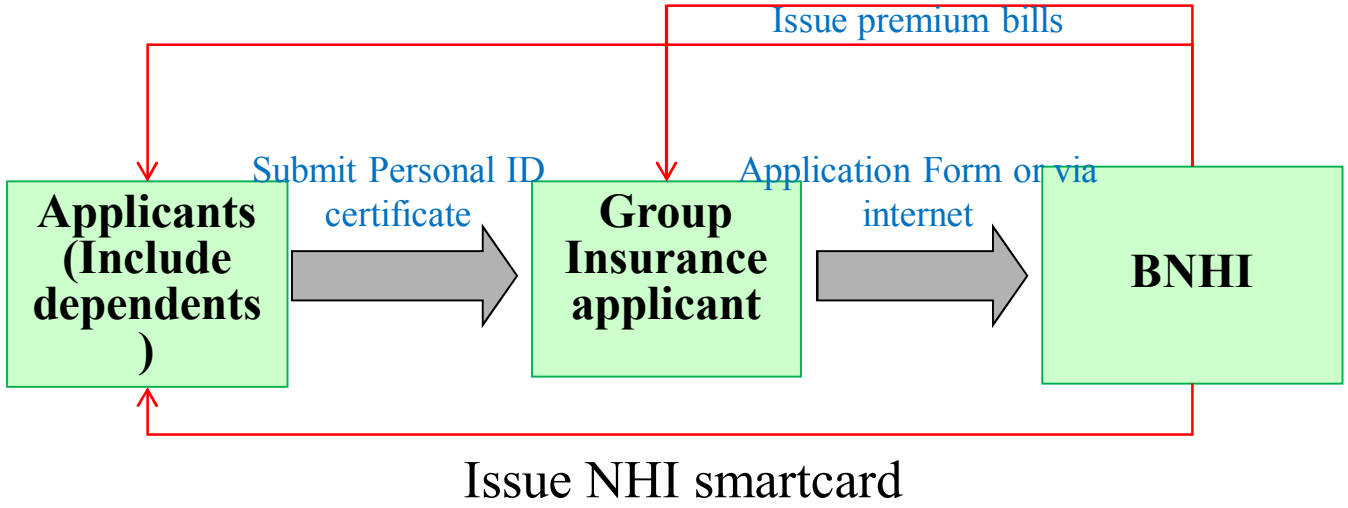
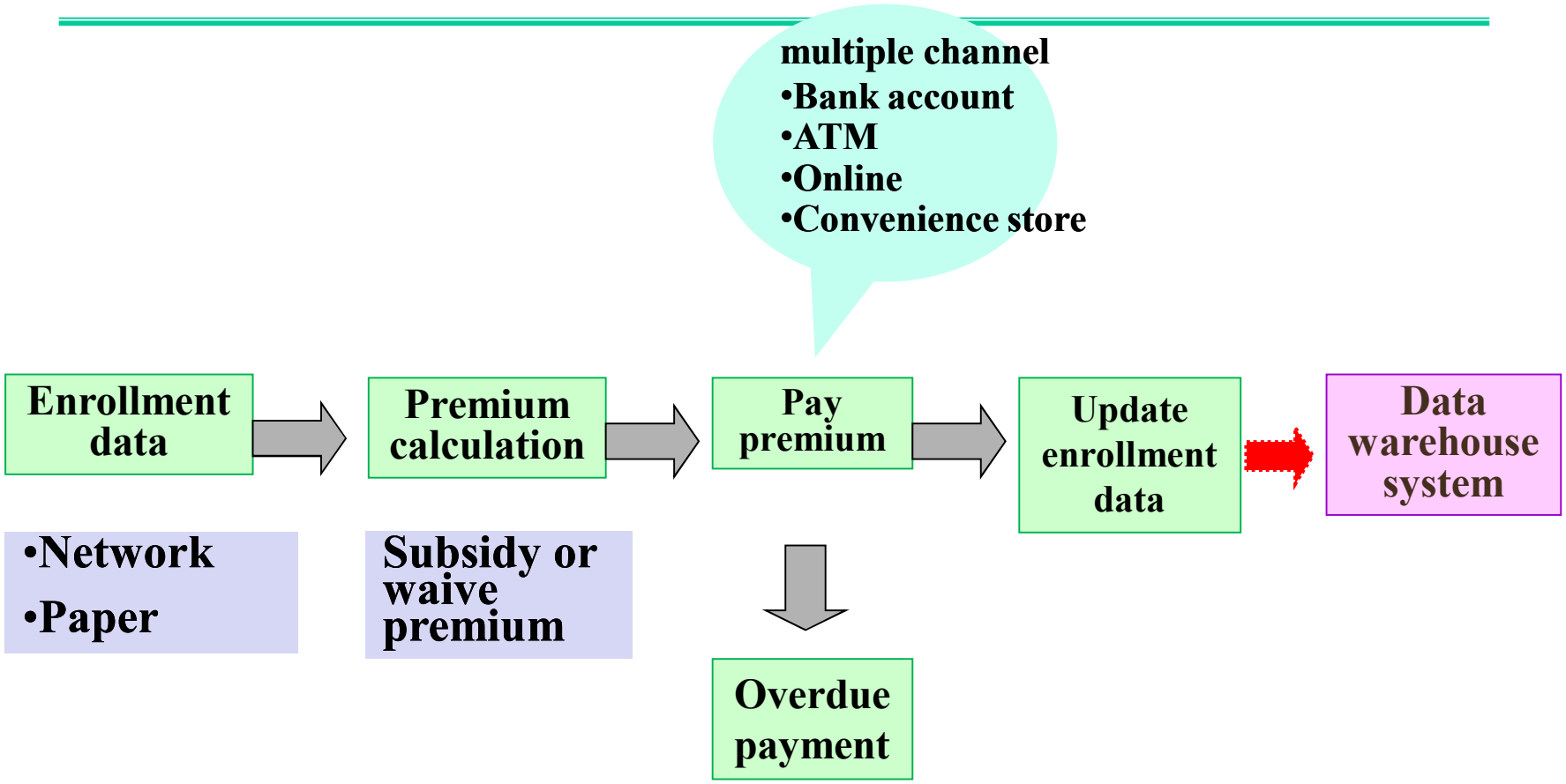
Enrollment Data Flow (I)



Enrollment Data Flow(II)



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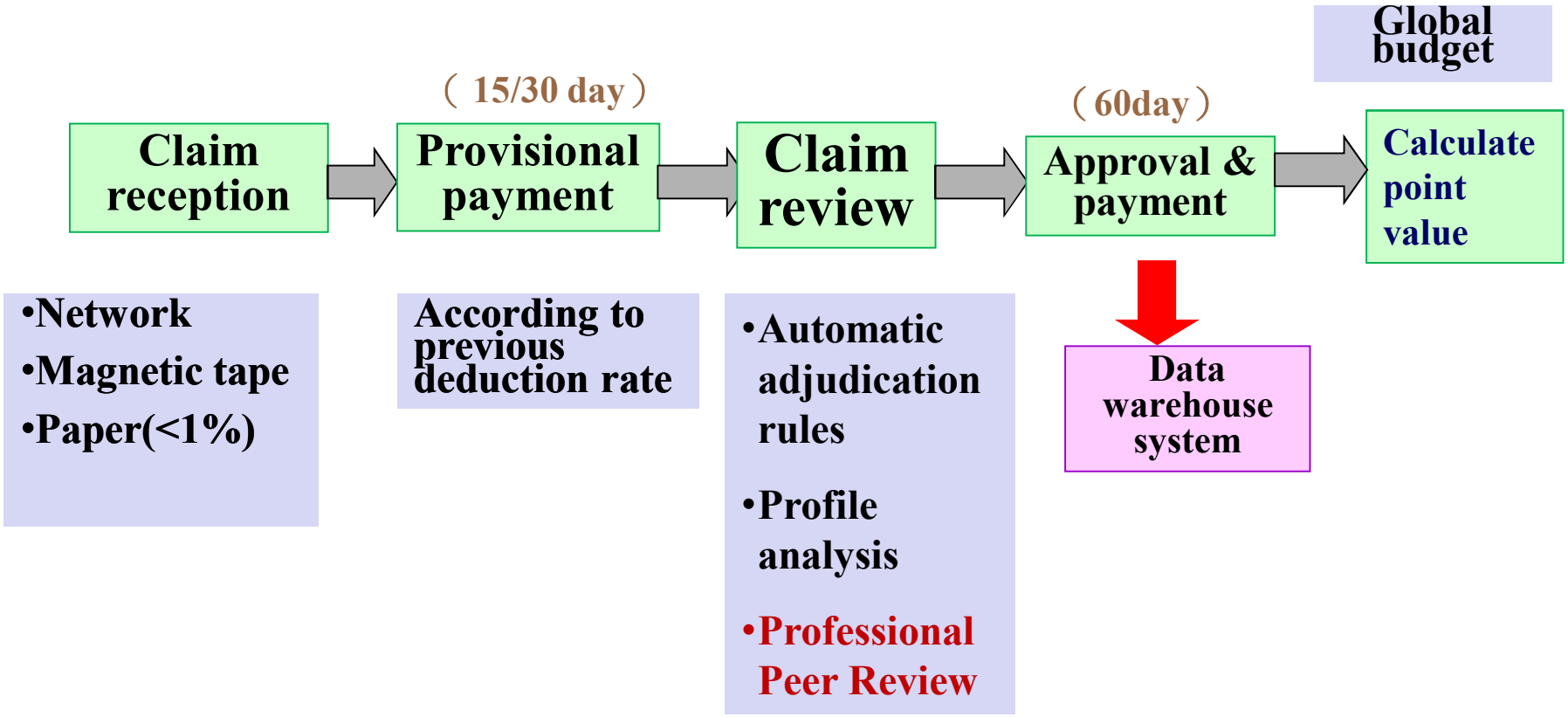
Claim Data Flow



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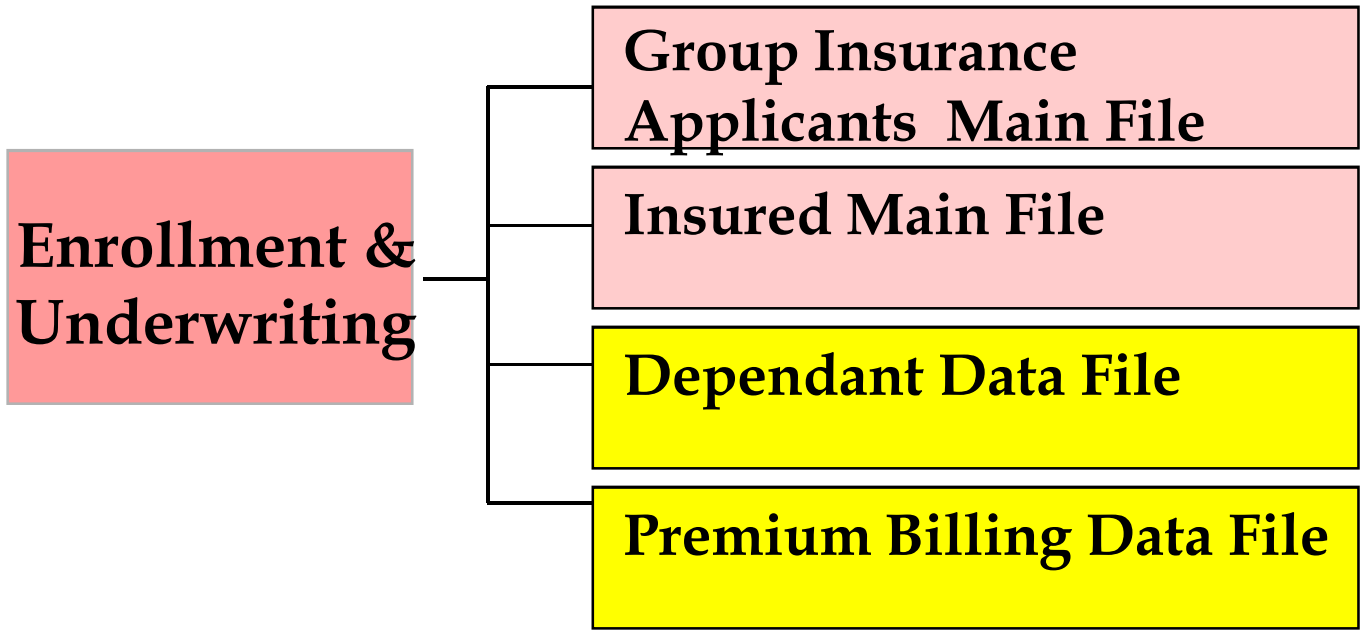
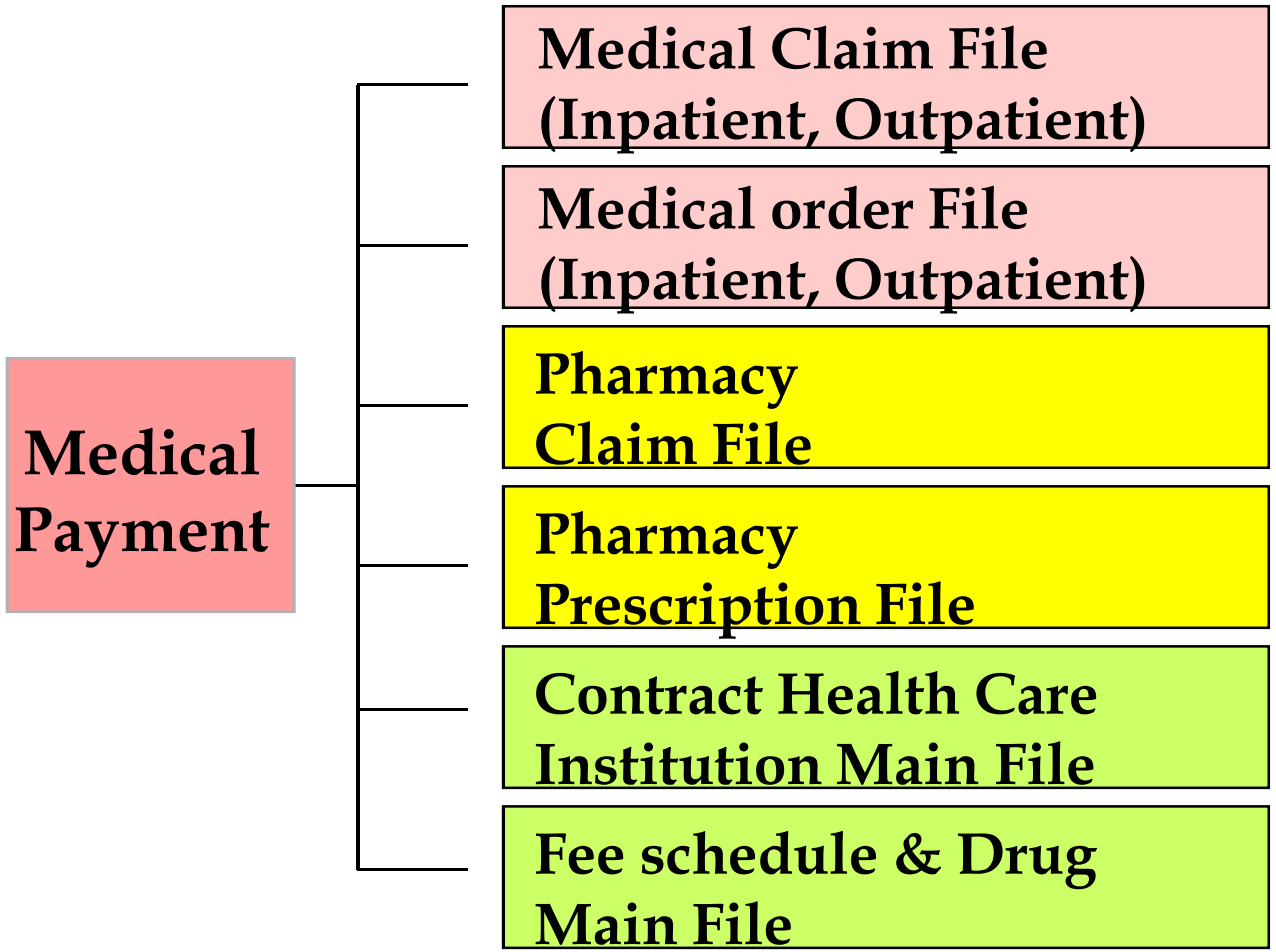
Enrollment Database



Medical Database



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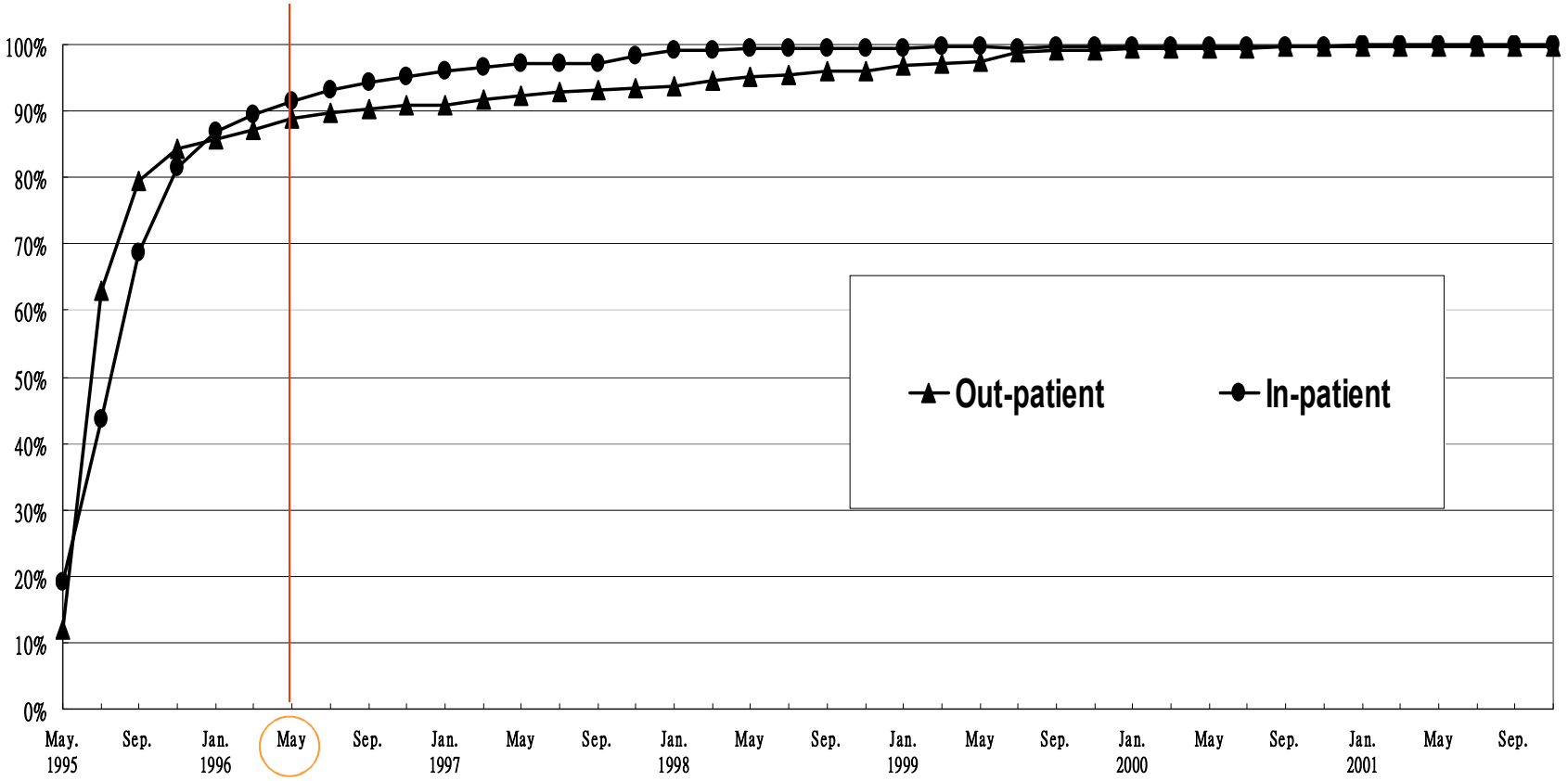
Medical Data Collection Method

Data Collection Strategy

- Single-payer payment system
- Unified claim form
- Standard coding table
- Set time table for hospitals to move to electronic claim
- Fast payment remittance for electronic claim
- Provide incentives to promote computerization

Electronic Medical Claims

The Rate of Claims through Electronic Media



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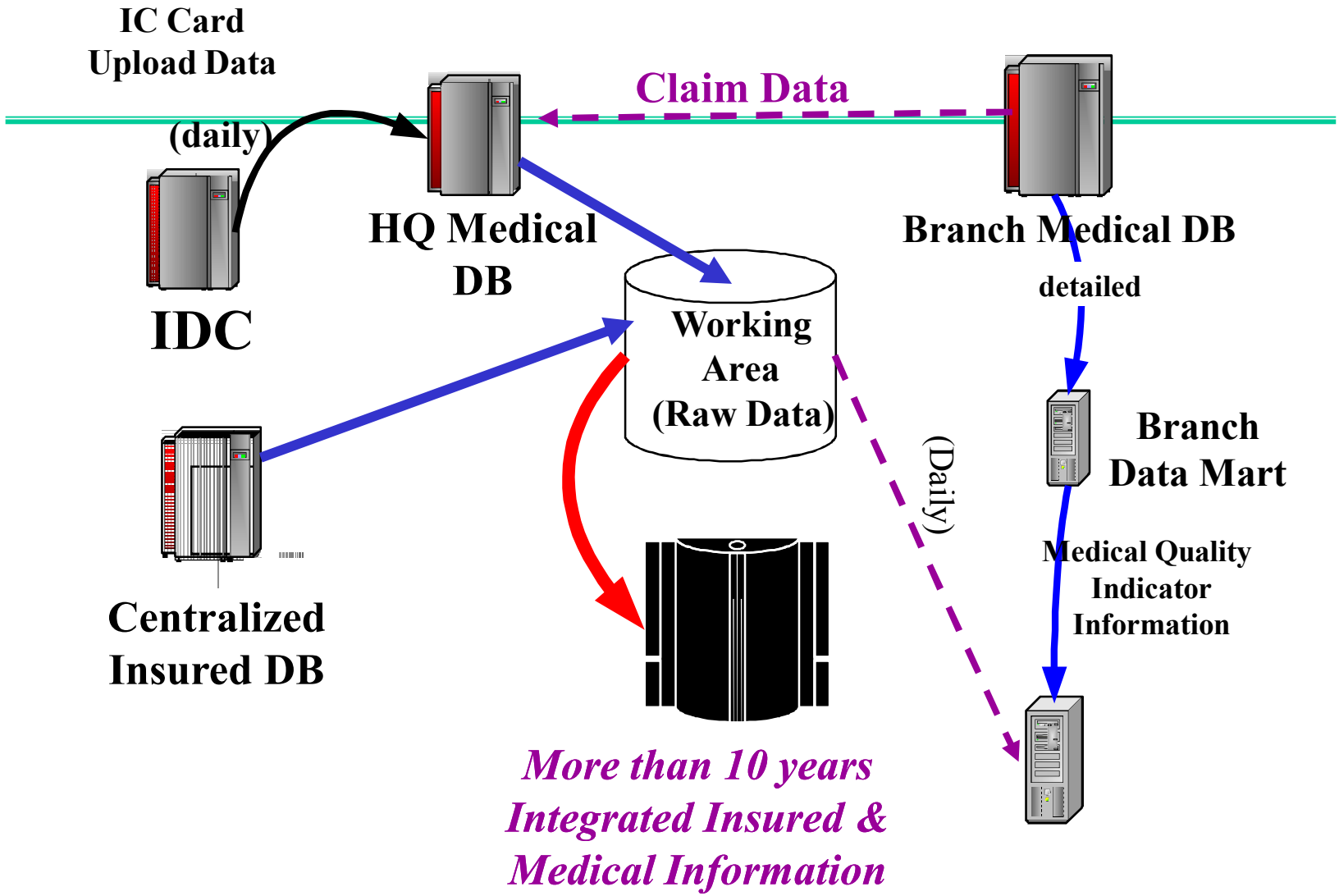
Data Warehouse System

Data Warehouse data flows



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Data Warehouse Supports

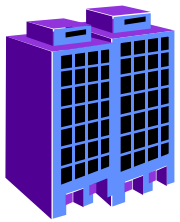
Dynamic Analysis(internal)

- Ad_hoc Query
- Pre-defined Query (ISGS)
- Data mining (experimental)

Enterprise Data Warehouse

Nationwide Profile Analysis (internal)

- Utilization Analysis By- specific medical order
- Utilization Analysis By- specific Disease
- Utilization Analysis By- patient
- Provider Profile



Research institutions

Depart of Health

Branch offices

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Healthcare Smart Card

Goal of NHI Smart Card

- Merge multiple paper cards into one
- Provide convenient card refresh service to people
- Real time check up patient's premium paid status
- Provide timely information on "where and when" patient received services
  - Validate utilization status at point of service to prevent fraud
  - Offer medical visits tracing function on those suspected communicable disease infection people
- Promote hospitals and clinics to further computerize and upgrade to on-line operation

Project Overview

- Issuing
  - 24M smart cards （ to insured ）
  - 300K reader SAM cards（to hospitals & clinics）
  - 16K card readers （to hospitals & clinics）
- Consulting (call center) services
- Implementing Internal H/W, S/W, AP and Data Processing Center (IDC)
- Provide API for Hospital Information System developing
- Training courses for hospitals end users.
- Total Budget – NTD 3.7 Billion(USD 120 Million)
- Formally implemented in Jan. 2004 (running for over 6 years!)

Project Infrastruture

Healthcare smartcard

Healthcare professional card

SAM CARD

Cards

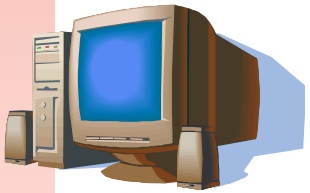
Readers

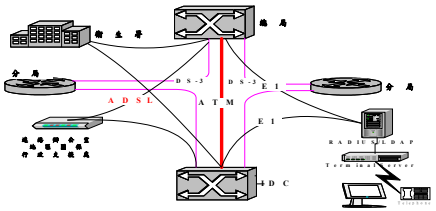
Services

Operation Component

Computer & Software

Networking





Healthcare Card

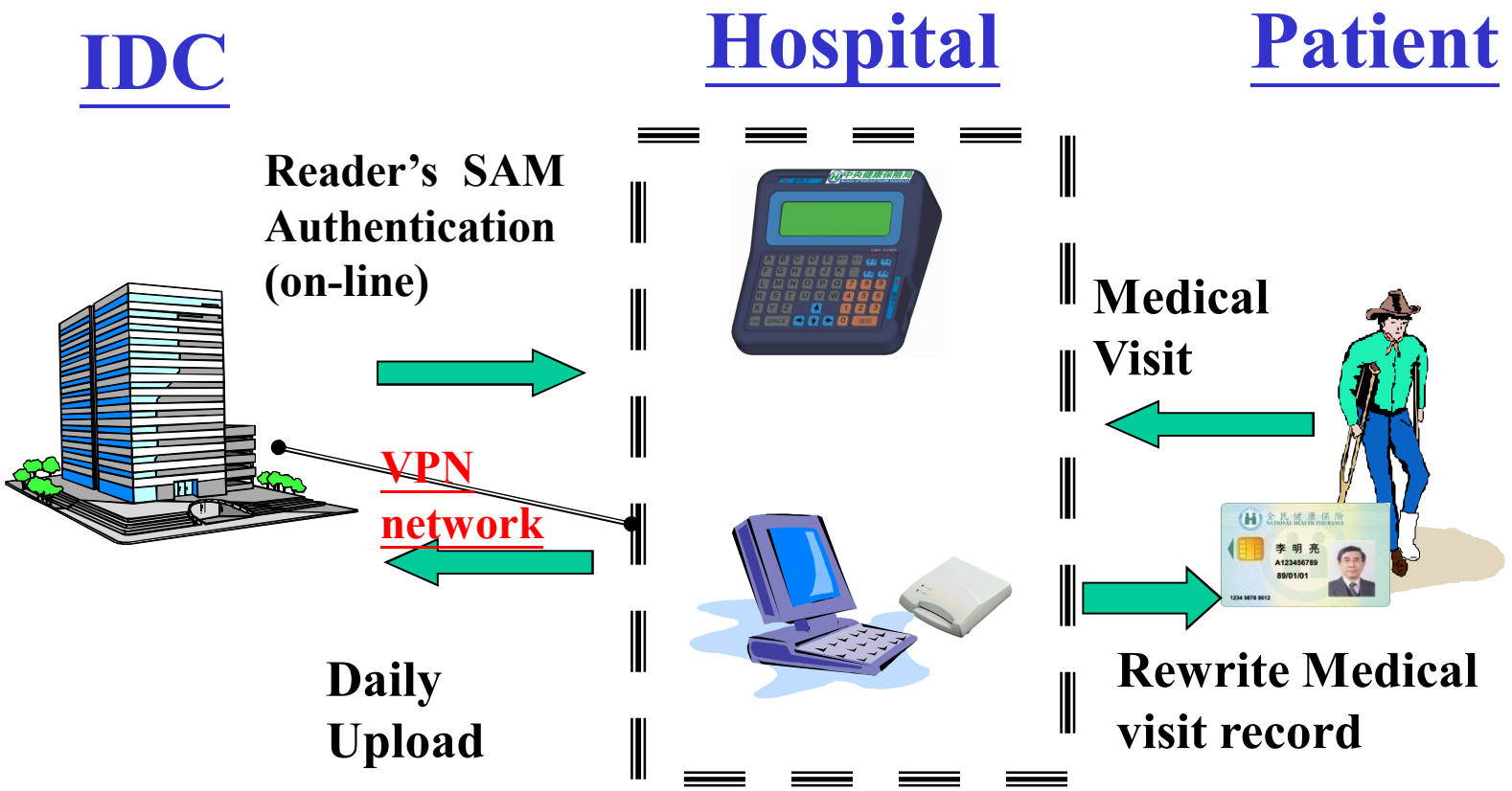
IC Chip

- Basic data section
- Insurance data section
- Medical care data section
- Public health data section

Explicit Data

- Name
- ID number
- Date of birth
- Photograph (voluntary, but 90% attached)

Smart Card Data flow



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Current Operation Status(1)

- 150,000 regular new card release service per month
- 200,000 on-line card refreshing (and status checking) e-service per day
- 50,000 on-line SAM authentication per day
- 1,200,000 medical visit data transmission per day
- 5,000,000 prescription data (and CT, MRI, PET records) transmission per day

Current Operation Status(2)

- **Keep the most recent 6 detailed medical visit records 60 prescription medicines or treatment in card → a simple but portable personal electronic medical record summary!**

Change of Management with Smart card

- **Monthly monitor of medical expenditure** → **Daily monitor of utilization**
- **Eligibility check possible annually** → **Instant checkup of patient's eligibility**
- **Data exchange with CDC on the project basis** → **Daily monitor of communicable disease**
  - →SARS (2003), H1N1
  - →Inbound traveler

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Future Perspectives in Technology

- **Provide more add-on values through network services**
- **Provide better quality information**
- **Information Security is still a issue**
- **Continue to do high utilization case management and assistance**
- **EMR (Electronic Medical Record)**
- **Cloud computing ?**

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Thank you

for your kind attention!

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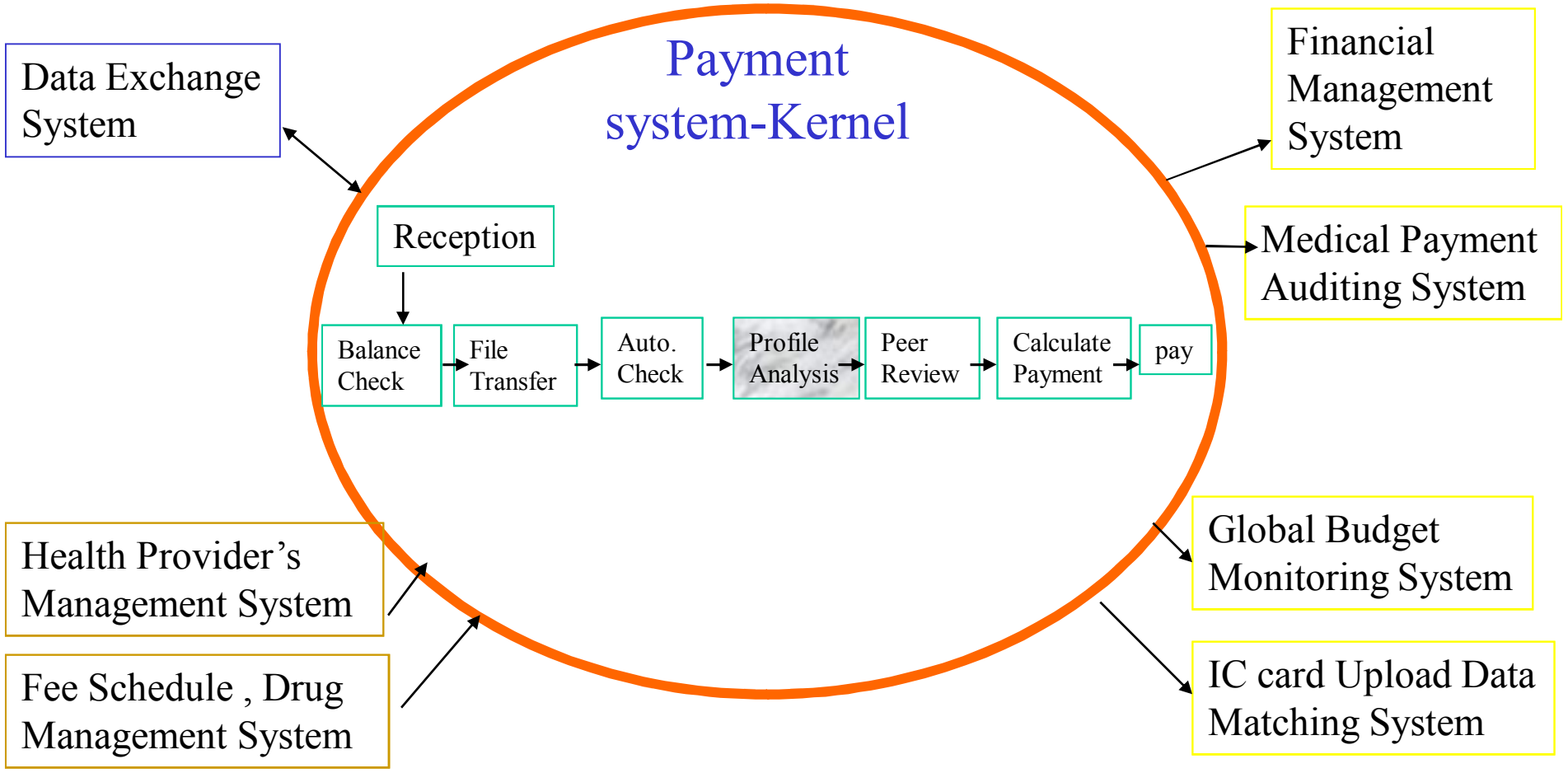
Appendices

Medical Data Content

- **Total File :** One Record per hospital per month
- **Detail File :** One Record per patient per visit
- **Order File :** contains all the drug or treatment information regarding each patient's medical visit

Medical Payment System



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Content of IC Card

- **Basic data: name, ID, birth date, serial #**
- **Insurance data: hospital ID, inpatient /outpatient expenditure, co-payments, exemption status, medical visit data**
- **Medical care data: major examinations, chronic disease/outpatient prescriptions, allergic medicines**
- **Public health data: childhood vaccination records, organ donation, DNR**

NHI Paper Card(1995~2003)

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