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Applying Technology to Business Problems™

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Architecting using the SOA and a Capabilities Model

- # July 21st, 2009

ApTSi ™
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- **Leadership**
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- **Strategy**
- **Integration & SOA**
- **Application Development & Reuse**
- **DB, EII & BI**

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- **This Presentation**
- Background
- Overview of the RA
- The example – an overview
- The Future and the present
- Applying the TOG SOA RA
- Summary and Conclusions

- Provides a brief overview of the RA usage scenarios

- Provides a brief overview of the TOG SOA RA

- Reviews one example of how the RA will be used by an organization adopting SOA to derive its own enterprise SOA RA
  - This will illustrate flows within the RA
  - The presentation also reviews the role of the The Open Group RA on relating security, SOA and the cloud, with one of the examples illustrating an organization adopting cloud computing based solutions for one of its capabilities

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The TOG SOA Reference Architecture provides a mechanism for users to understand and apply technical a

It helps architects answer the question:
- "What are the considerations and criteria for producing a SOA solution?"
- "How can a SOA solution be organized as an architectural framework with inter-connected architectures and transformation capabilities?
- How can a SOA solution be designed in a manner that maximizes asset reuse?
- How can automated tools take the guess work out of architecture validation and capacity planning?"

In particular it provides a high level abstraction of a SOA partitioned and factored into layers, each of which provides a set of *capabilities* required to enable the working of an SOA. Each layer addresses a specific subset of characteristics and responsibilities that relate to unique value propositions within a SOA.

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Background Continued

Usage Scenarios:

The TOG SOA RA supports the following scenarios:

1. Organizations adopting or having adopted SOA
    1. The RA provides a generic capability that is vendor independent
    2. The RA should define standard building blocks, architectural decisions and other attributes to create a framework of understanding sufficient to enable an assessment of conformance.

2. Product Vendors
    1. The reference architecture should provide a set of standards and enough specificity that they can use it to drive evaluation of compliance with those underlying standards.

3. Integrators
    1. The integrator should be able to use it as a model to define specific constraints and directions for SOA implementations.

4. Standards Bodies
    1. The RA should provide a reference against which they can extend standards, or provide guidelines, and more detailed levels of specificity etc

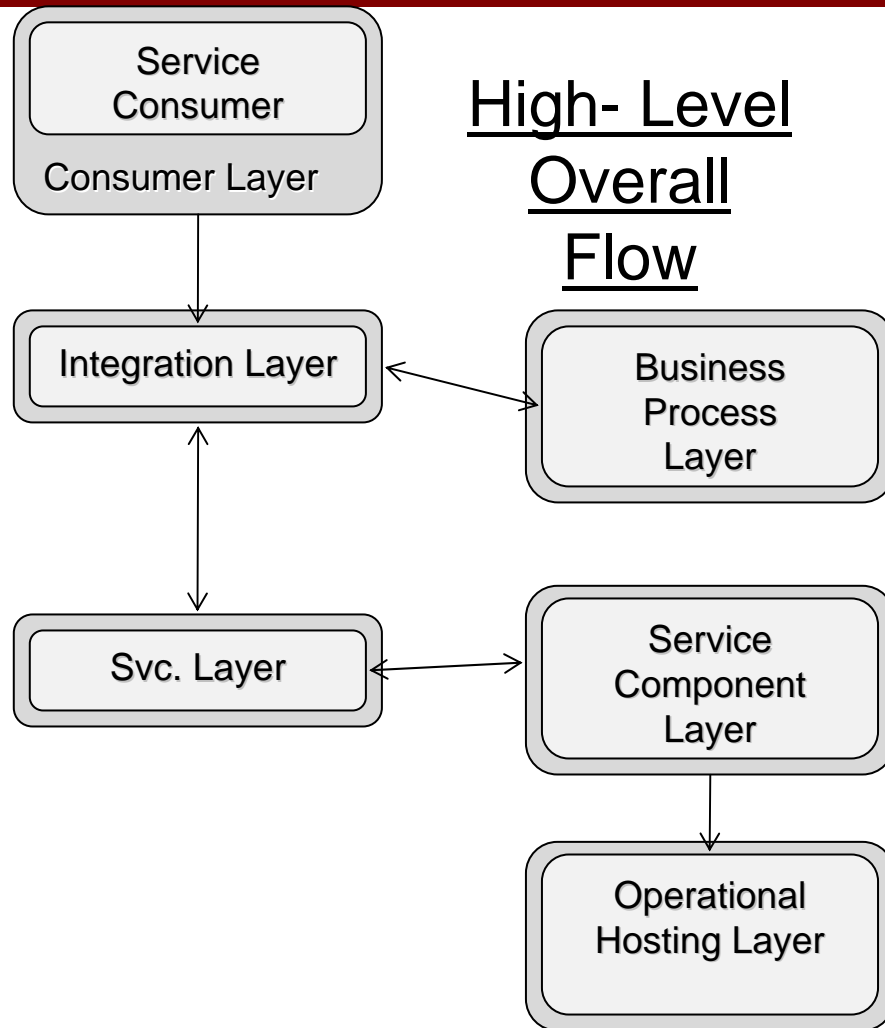The Open Group Enterprise Architect Practitioners Conference July 2009

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The TOG SOA Reference Architecture
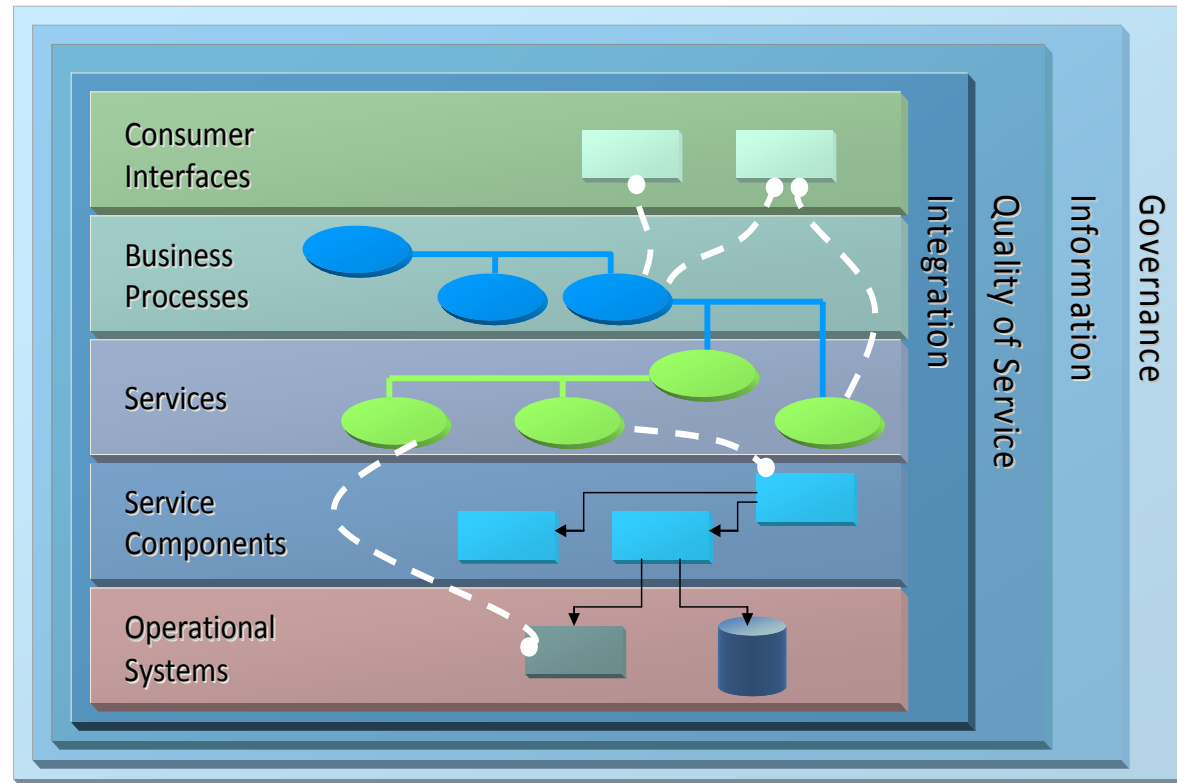
(C) The Open Group 2009

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The TOG Reference Architecture

```
┌─────────────────────┐
│   Service           │
│   Consumer          │          High- Level
│                     │           Overall
│ Consumer Layer      │            Flow
└─────────────────────┘
          │
          ▼
┌─────────────────────┐        ┌─────────────────────┐
│ Integration Layer   │◄──────►│    Business          │
│                     │        │    Process           │
└─────────────────────┘        │    Layer             │
          ▲                     └─────────────────────┘
          │
          ▼
┌─────────────────────┐        ┌─────────────────────┐
│   Svc. Layer        │◄──────►│    Service           │
│                     │        │    Component         │
└─────────────────────┘        │    Layer             │
                                └─────────────────────┘
                                          │
                                          ▼
                                ┌─────────────────────┐
                                │   Operational        │
                                │   Hosting Layer      │
                                └─────────────────────┘
```

1) Service consumers request services, using the Integration Layer
2) The Integration Layer invokes the service layer to discover & invoke service components
3) Service components invoke Operational Systems Components from the Operational Systems layer to carry out service time
4) The response turnover back up to the service consumer

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- The example covers scenario 1 – an organization adopting SOA
- We will first provide an overview of the example
  - The example covers EHR (Electronic Health Records) for a small to mid-size hospital system
  - Acme Healthcare Provider Corp. (AHCP) has a number of different systems. They have been required by regulatory reasons to comply with the US federal governments Electronic Health Record standards initiative. The IT department sees this as an opportunity to transition the organization to a SOA.

- We will list the KPIs, provide a background of the systems and the current and future state system deployment scenarios

TOG SOA RA: The example: Success Factors/ KPIs

- Reduction of death by clinical negligence

- Post-operative death count

- Payor performance
  - % of claims processed

- Physician performance

- Compliance with the EHR requirement
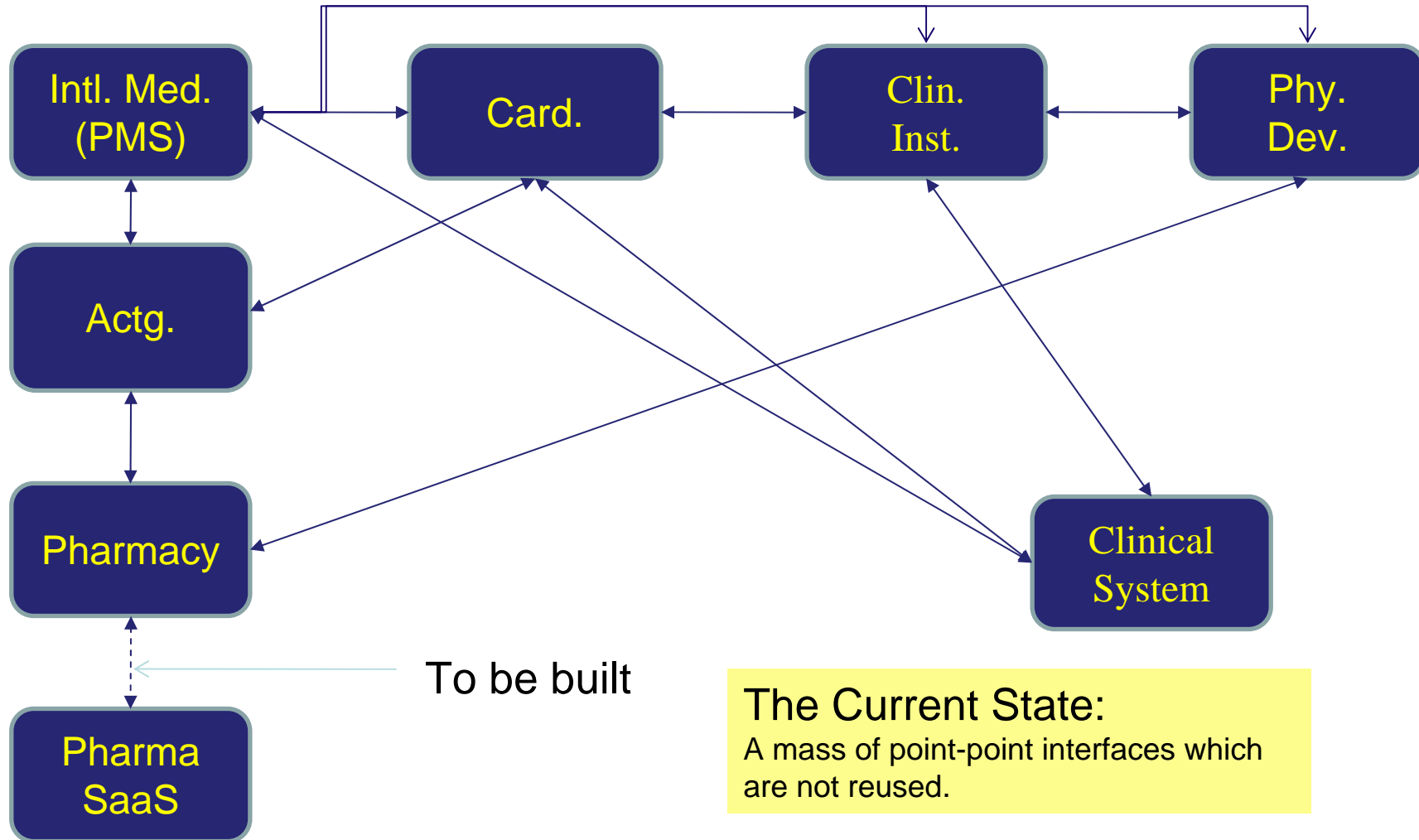
TOG SOA RA: The example: Success Factors/ KPIs

Actor	System	Platform	Data Quality	Feed Freq.	ID Cap	Format	Tool/OS
Physician/ Nurse	Clinical Sys. Intl. Med.	Unix HP-UX	90%	Near Real Time	95%	HL-7	Cerner
Physician/ Nurse	Cardiology	UNIX IBM AIX	95%	Nightly 24 hours	98%	HL-7 V2.3	Prop.
Pmts./ AR clerk	Actg.	Linux SAP	90%	Nightly 24 hours	90%	Prop ; EDI/EDI FACT	SAP
Pharmacy	Pharmacy App.	Windows .NET	80%	On Demand Near Real Time	90%	SCRIPS	Prop/ COTS
Nurse/ Pharmacist/ etc.	Xtl. Pharmacy	Unknown SaaS	90%	On Demand Near Real Time	90%	SCRIPS	Data Feed
Phy./ Handheld Device	Pharm. System Handheld	Mac Os	90%	Real time	95%	SCRIPS	Realtime
X-ray	Clinical Inst.	RTOS	98%	Real time	98%	DICOM	Prop Embed System

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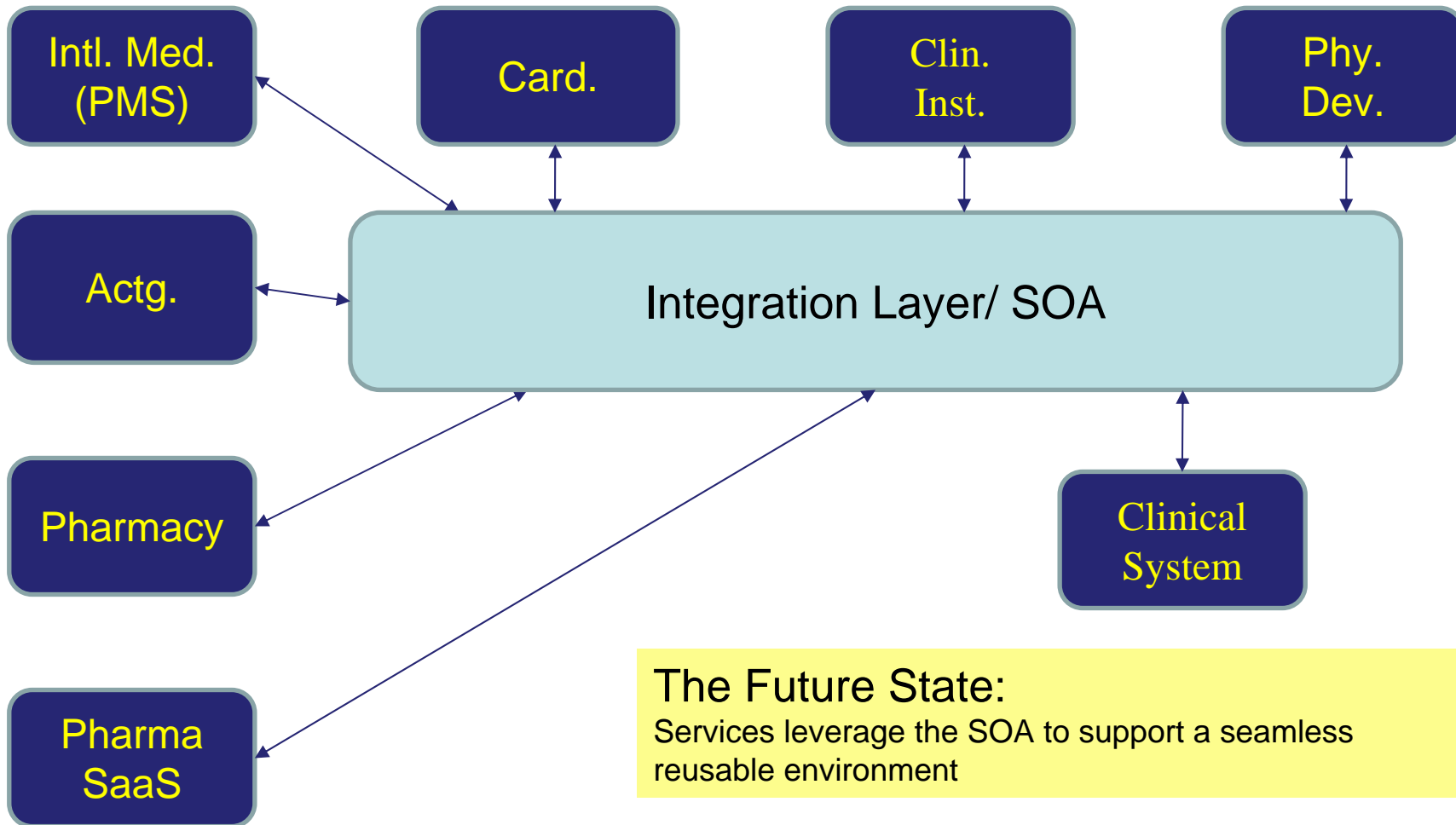TOG SOA RA: The example: Compliance Reg. Rqmts

- HIPPA

- EHR – ARRA/CCHT/ CCR

- DICOM

- SCRIP

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To be built

The Current State:
A mass of point-point interfaces which are not reused.

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Intl. Med. (PMS)

Card.

Clin. Inst.

Phy. Dev.

Actg.

Integration Layer/ SOA

Pharmacy

Clinical System

Pharma SaaS

The Future State:
Services leverage the SOA to support a seamless reusable environment

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TOG SOA RA: The example: Using the RA

- ### Flow 1 – basic flow
  - We will use this flow to understand the interactions
  - We will determine required capabilities
  - Apply architectural decision points

- ### Flow 2 – more complex flow
  - We will use this flow to understand the scenarios such as cloud, business process layer and cloud scenarios
  - We will determine required capabilities
  - Apply architectural decision points

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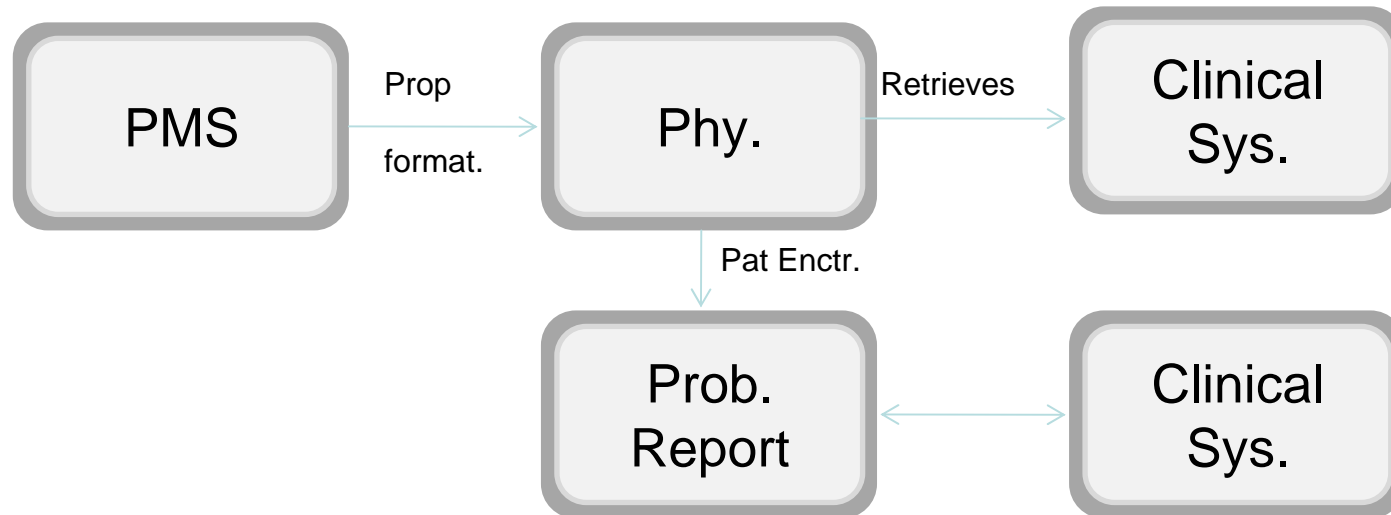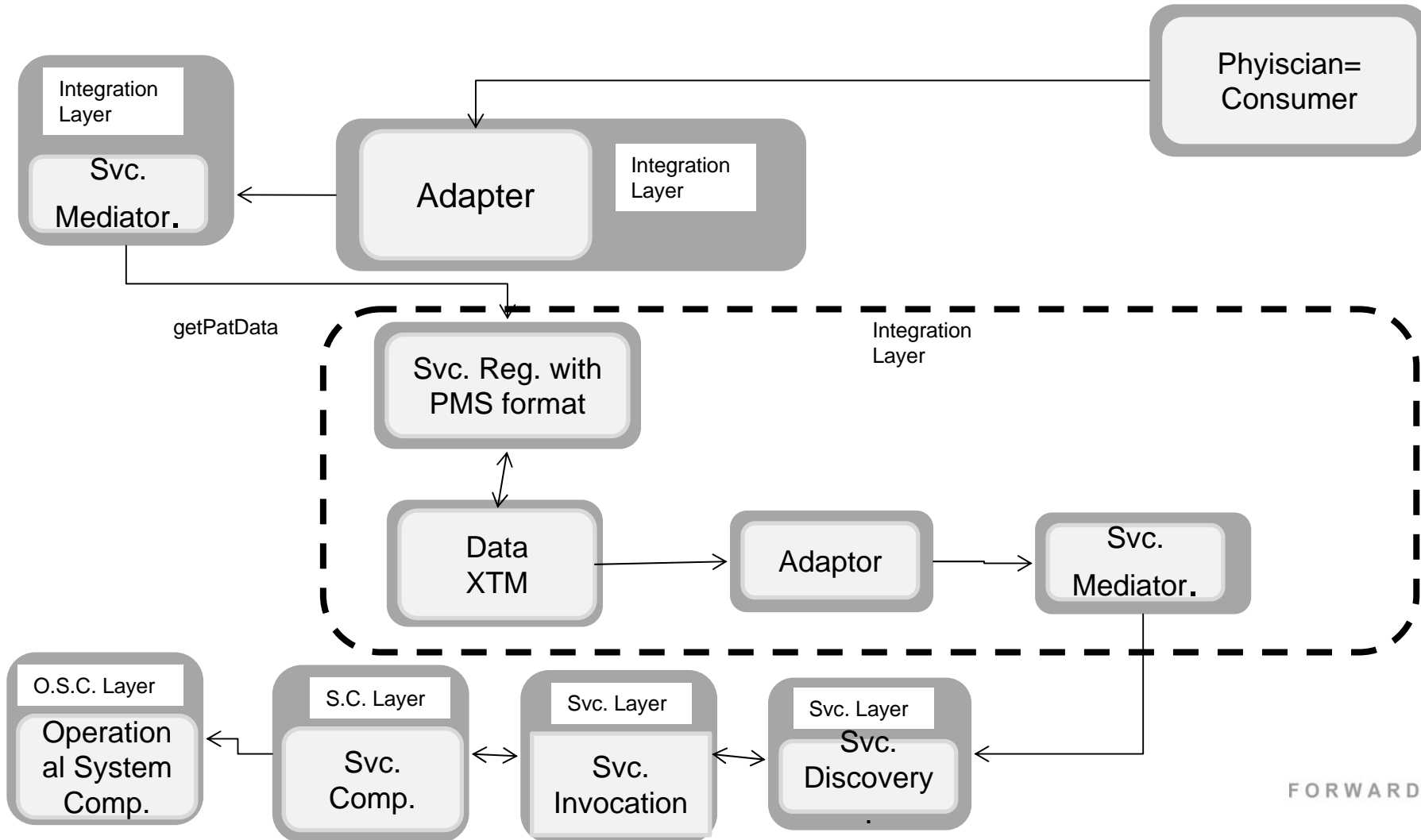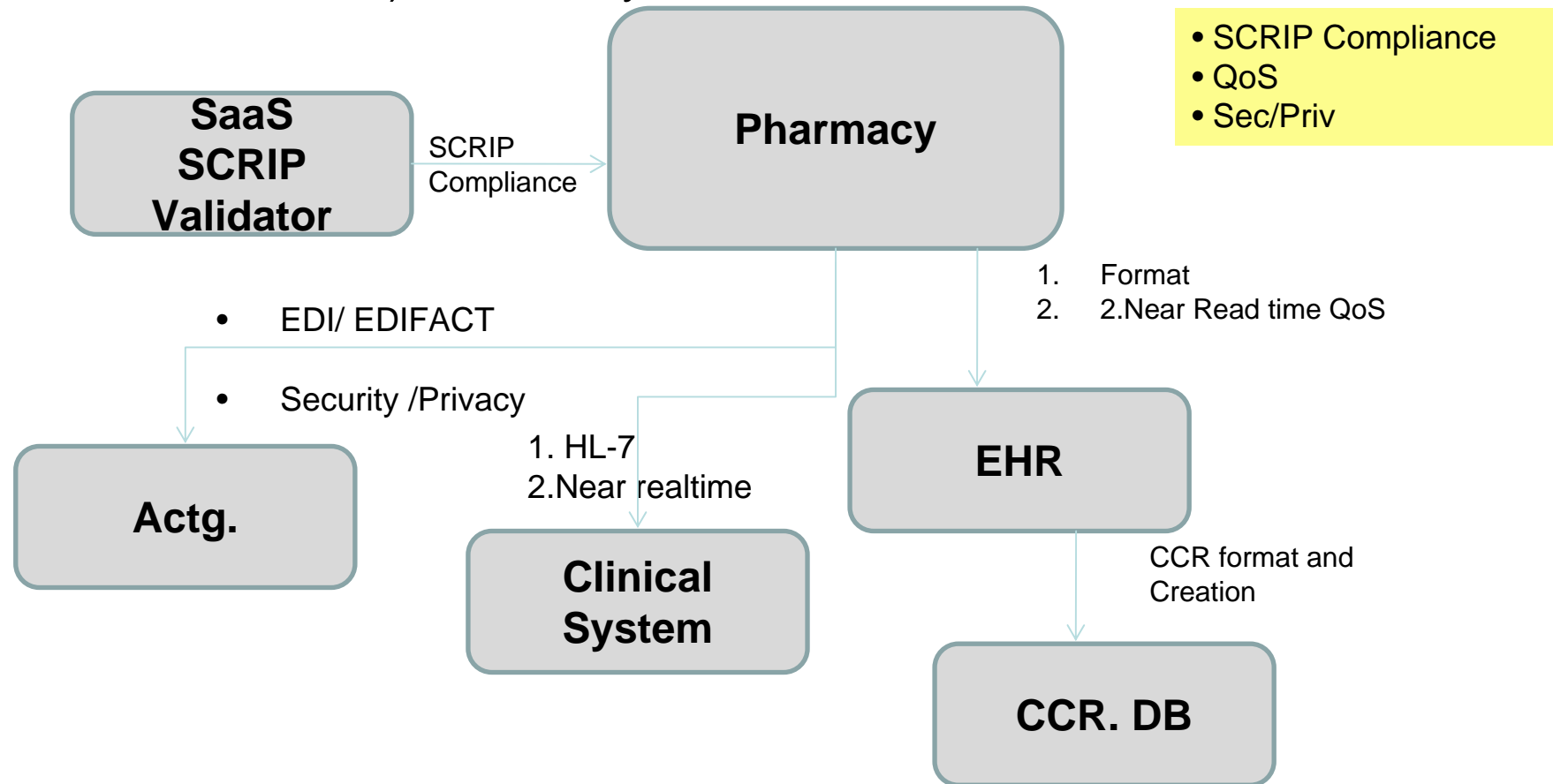- Summary and Conclusions

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Patient in System

```
┌──────────┐   Prop        ┌──────────┐  Retrieves   ┌──────────┐
│          │ ─────────────►│          │ ───────────► │ Clinical │
│   PMS    │   format.     │   Phy.   │              │   Sys.   │
│          │               │          │              │          │
└──────────┘               └──────────┘              └──────────┘
                                │
                                │ Pat Enctr.
                                ▼
                           ┌──────────┐              ┌──────────┐
                           │  Prob.   │◄───────────► │ Clinical │
                           │  Report  │              │   Sys.   │
                           └──────────┘              └──────────┘
```

Scenario 1:
The patient interacts with the PMS

Typical Flow Through RA

Phyiscian=
Consumer

Integration
Layer

Svc.
Mediator.

Adapter

Integration
Layer

getPatData

Integration
Layer

Svc. Reg. with
PMS format

Data
XTM

Adaptor

Svc.
Mediator.

O.S.C. Layer

Operation
al System
Comp.

S.C. Layer

Svc.
Comp.

Svc. Layer

Svc.
Invocation

Svc. Layer

Svc.
Discovery
.

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Flow 2: Scenario uses Cloud Computing (Pharmacy Scenario): SaaS only

SaaS SCRIP Validator

SCRIP Compliance

Pharmacy

- SCRIP Compliance
- QoS
- Sec/Priv

1. Format
2. 2.Near Read time QoS

- EDI/ EDIFACT
- Security /Privacy

Actg.

1. HL-7
2. Near realtime

Clinical System

EHR

CCR format and Creation

CCR. DB

Scenario 2:
The pharmacy system interactions

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TOG SOA RA: The example: Applying the RA

What capabilities do we need?

- Business Process Layer
  - Need to handle workflow, service comp./decomp, rules; etc.
- Integration Layer
  - Adapter; mediation; routing
- Service Layer
  - Discovery; versioning; binding; etc.
- Service Component Layer
  - Binding to platforms
  - Standardization of the services
  - Decouple from the underlying Operational Systems Components

- Operational Systems Layer
  - Leverage the legacy
  - Decouple from dependency
  - Deal with security in a centralized, federated fashion

- Cross-Cutting Concerns
  - QoS
  - Security
  - Governance
  - Information Architecture

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TOG SOA RA: The example: Applying the RA

Integration Layer

    a) Drivers

        1)Convert all Data to HL-7 & feed into EHR System

        2)NFR's

            -ID correct cap/reliability of data

            -Security

            -Monitoring &QoS constraints

            - BAM

        3) Future Channels

    b) What Exists

        1) Pt. to Pt. Int. Built on some querying soln. & TCP/IP int.

    c) Identify Update Capabilities

Arch Dec. Pts

    -ABB

    -NFR's

Consumer Layer
    a)Driver
        1) Current Channels
        2) Future Channels
        3) SaaS & Cloud Solutioning
        4)NFR's
    b) Constraints
        PMS- Windows 2003 based
    c) Id Capabilities
Arch Dec. Pts.
    -Go with portaling Solution- Ascl-du-pts
    -What stds?
        eg. JSR 168
            WSRP fro WS Integration

TOG SOA RA: The example: Applying the RA

What ABB's/ Arch. Decision Points do we need?

- Business Process Layer
  - Need to handle workflow, service comp./decomp, rules; etc.
- Integration Layer
  - Adapter; mediation; routing
- Service Layer
  - Discovery; versioning; binding; etc.
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  - QoS
  - Security
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  - Information Architecture

TOG SOA RA: The example: Applying the RA

Are we deriving our RA to meet the KPIs?

- Business Process Layer

- Integration Layer

- Service Layer

- Service Component Layer

- Operational Systems Layer

- Cross-Cutting Concerns
  - QoS
  - Security
  - Governance
  - Information Architecture

- Reduction of death by clinical negligence

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Applying The TOG SOA RA

What we have covered

1.Background and Understanding of RA
2.Drivers
3.Application

Not Covered
1.Business Aspect
2.More scenarios

Thank you!

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