

Integrating the Healthcare Enterprise

IHEをマトリックスで 考える

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IHEは、効率的な医療情報
システムを構築するのに
必要なキーワードです。



IHEのキーワード

- IHEとは、何ですか？
- IHE活動(IHEサイクル)
- Technical Framework
- 基本的な機能とアクター
- 専門分野(Domain)
- マトリックスとは？
- 分野別の最新トピックス
- IHEの限界
- IHE活動への参加

IHEとは何ですか？

- 1999年にアメリカでRSNAとHIMSSが共同で立ち上げた活動です。
- Integrating the Healthcare Enterpriseの略で、日本語では、「医療連携のための情報統合化プロジェクト」と呼ばれています。
- 医療分野のIT化の一環として、複数の医療情報システムを連携して、システムの効率化を促進します。
- 業務フローを分析し、システム間の相互運用性を改善。

IHE活動（IHEサイクル）

- ユーザーとベンダーが協力して、情報システムの問題点を検討
- Workflowを分析し、業務シナリオ(Integration Profile)の作成
- 業務シナリオを実現するために、Actor(機能単位)とTransaction(通信手順)を定義
- 成果物がTechnical Framework
- Technical Frameworkに則り接続テスト
- 結果の公開およびIHE活動の普及

ベンダの
技術

同じような問題を抱える
医療機関への適用が
可能となる。

医療機関はIHEを
要求仕様に含める

業務シナリオ
(統合プロファイル)

既存の規格を用いて
問題解決

IHE テクニカルフレーム
ワークによる
問題解決

ベンダによる
製品への実装

1サイクル
1.5～2年

専門学会などで、
IHEによる問題解決が
あることをデモや
教育する

コネクタソンでの
接続テスト



Technical Framework

- IHE活動の成果物

- Technical Framework

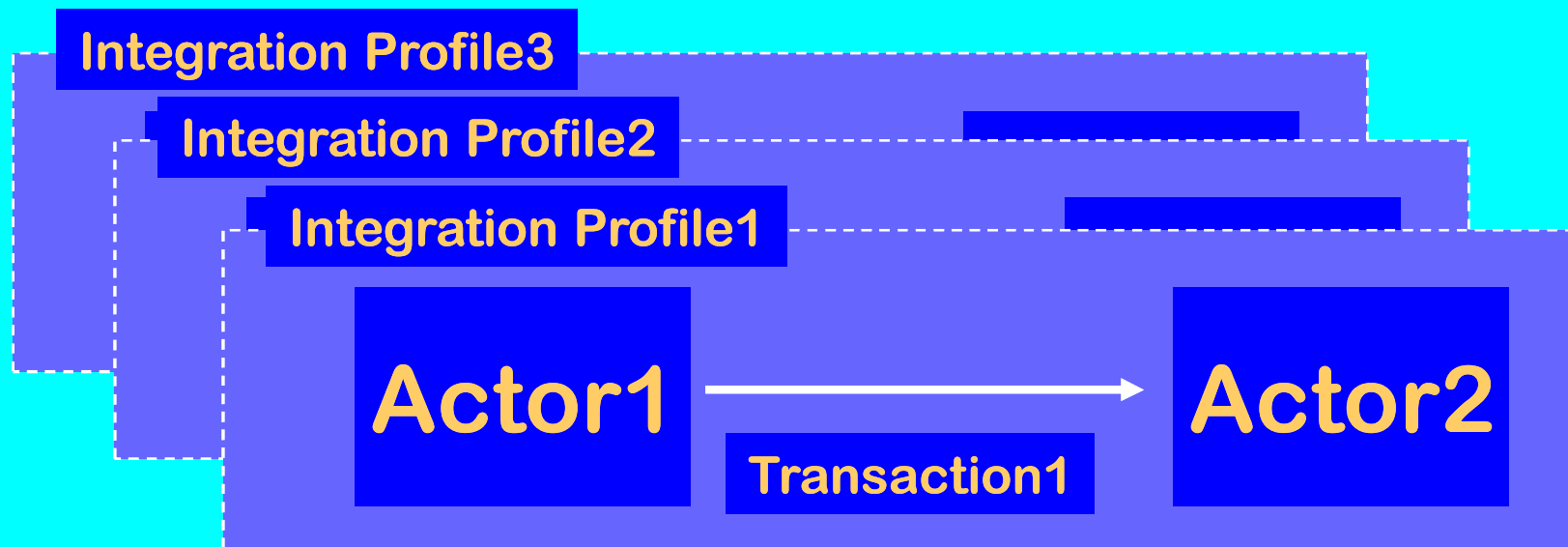
- Integration Profile 業務シナリオ
例：予約を伴う検査のスケジュール機能 (SWF: Scheduled Workflow)
- Actor
例：オーダー発行 (OP: Order Placer)、オーダー受け (OF: Order Filler)
- Transaction
例：患者登録、発行元オーダー管理、受け側オーダー管理

IHEを理解するための用語

● Technical Framework: 技術定義書

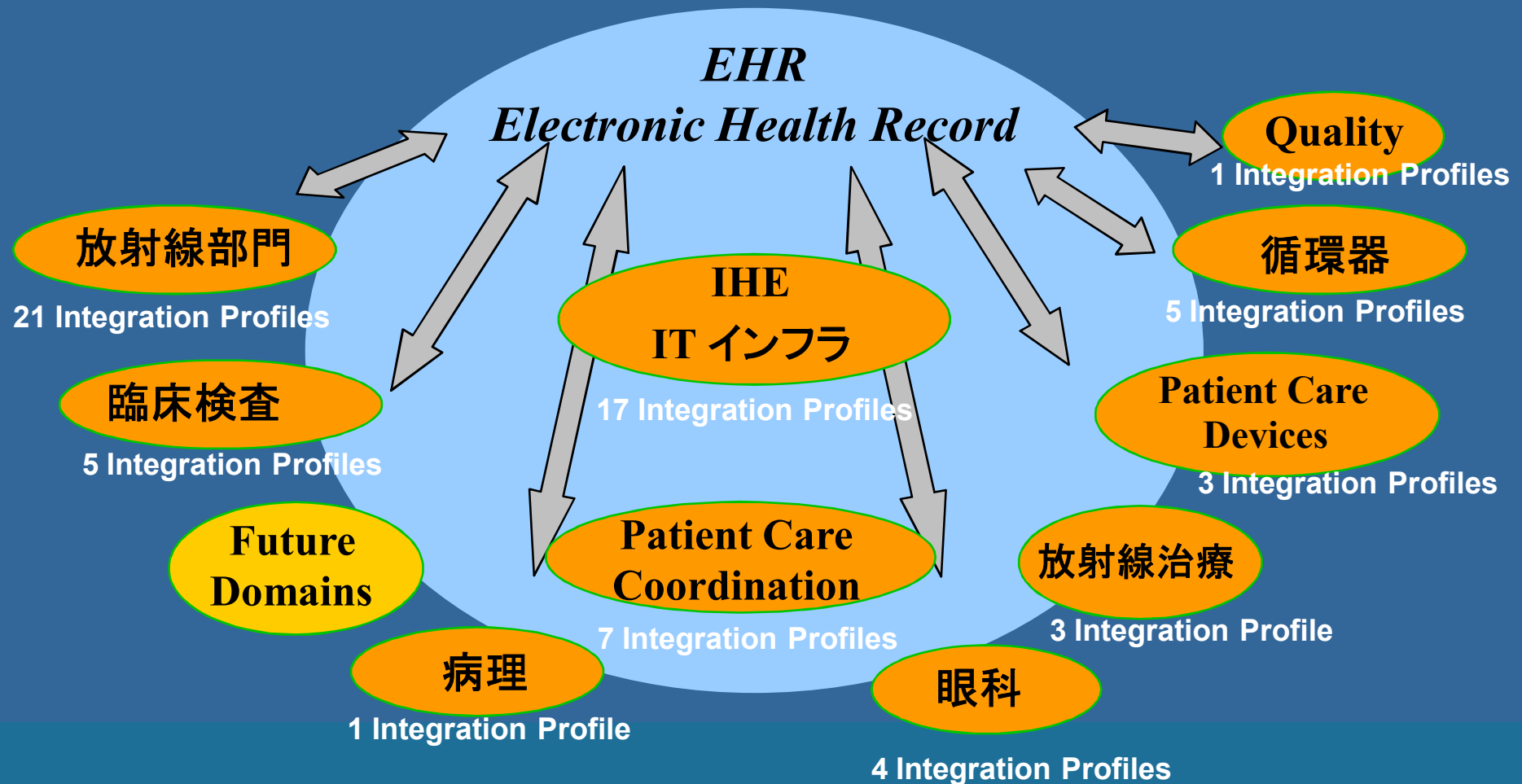
- Integration Profile: 業務シナリオ
- Actor: ひとまとまりの機能
- Transaction: 通信手順

Technical Framework



専門分野 (Domain)

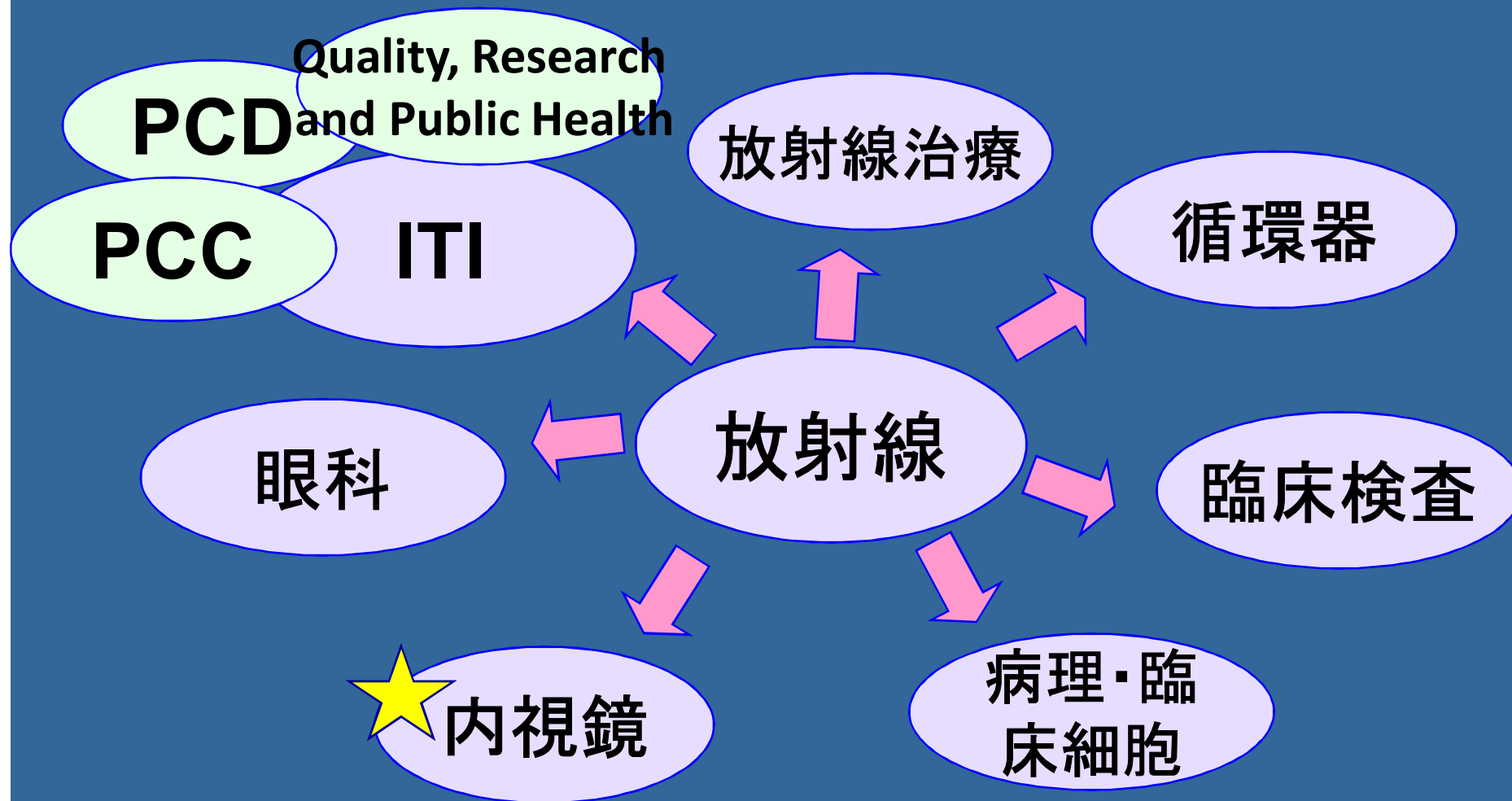
100 を超えるベンダ、10 のテクニカルフレームワーク
60 を超える統合プロファイル、コネクタソンによる接続テスト
世界各地でのデモンストレーション



専門分野 (Domain)

- IHEでは、医療情報システムを分野別に分けます。この分野をIHEでは、ドメインと呼びます。
- 現在、以下のような10個のドメインがあります。
 - Anatomic Pathology
 - Cardiology
 - Eye Care
 - IT Infrastructure
 - Laboratory
 - Patient Care Coordination
 - Patient Care Devices
 - Quality, Research and Public Health
 - Radiation Oncology
 - Radiology

日本IHE協会のドメイン



PCC: Patient Care Coordination
PCD: Patient Care Device

各専門分野(1)

	分 野	内 容
1	放射線検査	放射線診断の検査一般を扱う
2	臨床検査	血液・尿検査などの検査を扱う
3	循環器	心カテなどの検査を扱う
4	病理検査	病理検査を扱う
5	眼科	眼科の検査や診療を扱う
6	放射線治療	放射線治療の業務シナリオを扱う

各専門分野(2)

	分 野	内 容
7	PCD(患者ケア用装置)	Patient Care Device 主に手術室の機器のデータ交換を扱う
8	PCC(患者ケアの連携)	Patient Care Coordination 施設間連携の時に、医療情報の内容を定める
9	Quality, Research and Public Health (医療の品質)	品質管理のための業務シナリオ
10	IT Infrastructure(情報通信技術の基盤)	システム間や施設間の情報連携のために、各分野に共通する基本的な業務シナリオを扱う

IHEにおけるマトリックス

	分野1	分野2	分野3	...
機能1	業務シナリオA		業務シナリオC	
機能2		業務シナリオB	業務シナリオD	
...				

業務シナリオには、ActorとTransactionが含まれる。

マトリックスとは

検体検査、眼科、
病理・臨床細胞、
内視鏡

機能 \ 分野	放射線診断	放射線治療		
HISとの連携	SWF, PIR	ESI, MDW	SWF, PIR	
検査装置 関連	NMI	NTPL-S	CATH, ECHO	
レポート結果	SINR, RWE		ECG, DRPT	
エビデンス	施設間連携、監 査証跡、その他 (会計処理、画像 表示)		ED	
...				

部門別業務シナリオ①

分野	放射線	循環器	検体検査	眼科	放射線治療	病理・臨床細胞	内視鏡
HIS との連携・進捗管理・ワークフロー	●予約済みのワークフロー (SWF) ●患者情報の整合性確保 (PIR) ●後処理ワークフロー (PPW)	●循環器のワークフロー (SWF) ●患者情報の整合性確保 (PIR)	●検体検査のワークフロー (LTW) ●ベッドサイドの検査 (PCT)	●眼科のワークフロー (EYECARE)	●放射線治療情報処理ワークフロー (ESI) ●治療のワークフロー (Managed Delivery Workflow)	●病理ワークフロー (APW)	
検査装置関連	●核医学画像 (NMI) ●乳房撮影 (MAMMO) ●ヒュージョン画像 (FUS)	●心カテ検査 (CATH) ●心エコー検査 (ECHO)	●検査装置との連携 (LDA) ●ベッドサイドの検査 (LPOCT)		●治療計画・線量計算 (NTPL-S) ●画像重ね合わせ (Image Registration)		
レポート・結果	●画像と数値を含むレポート (SINR) ●レポートワークフロー (RWF)	●心電図結果参照 (ECG) ●表示可能レポート (DRPT)		●眼科表示可能レポート (EC-DR)			

部門別業務シナリオ②

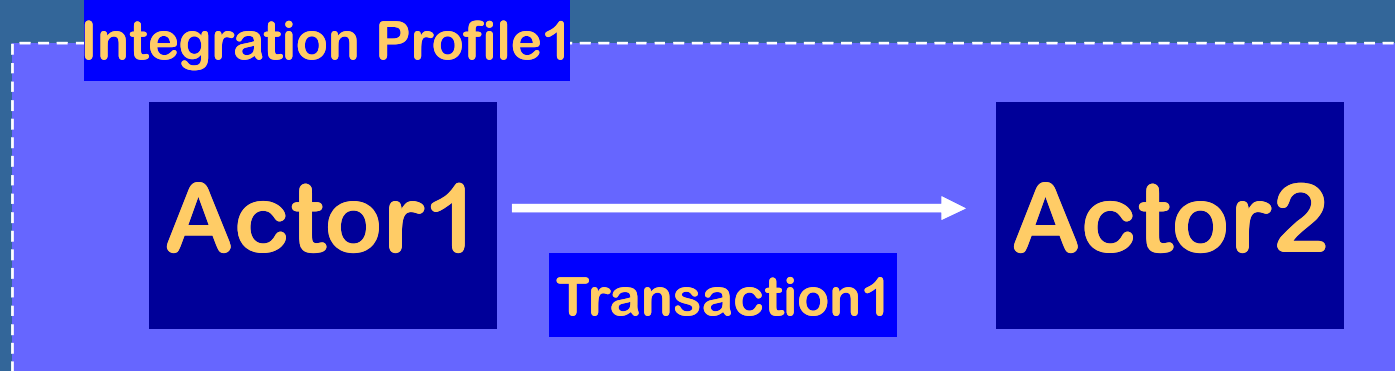
分野	放射線	循環器	検体検査	眼科	放射線 治療	病理・臨床 細胞	内視鏡
エビデンス	●エビデンス文書(ED) ●キー画像(KIN)	●エビデンス文書(ED)		●エビデンス文書(ECED)		●エビデンス文書(ED)	
施設間など	●施設間画像共有(XDS-I) ●可搬媒体による情報交換(PDI)		●施設間検査結果共有(XD-LAB)				
その他	●会計処理(CP) ●端末認証と監査証跡(ATNA) ●画像表示の一貫性(CPI)		●ラベル出力(LBL) ●コードセットの配布(LCSD)	●会計処理(EC-CHG)			
ITI	●監査証跡・ログ(ATNA) ●時刻同期(CT)	●施設間文書共有(XDS) ●患者ID相互参照(PIX) ●患者情報検索(PDQ)	●シングルサインオン(EUA) ●患者選択の連動(PSA)	●PAM ●PDQ ●PIX	●BPPC	●RID	

IHEにおけるマトリックス

- 専門分野とActor
- コネクタソンの結果表
- 専門分野とIT-Infrastructureの機能
- 業務シナリオとActor

業務シナリオとActor

- 一つの業務シナリオには、2個以上のActorが含まれる。
- 複数の専門分野の業務シナリオに同じ名前のActorがある。これらの機能は、似ている。
- Actorの機能は、トランザクションに細かく定義されている。



Connectathon

- 接続テストをIHEでは、コネクタソンと呼びます。
- 日本IHE協会では、接続性検証委員会が行っています。
- 接続結果は、ホームページで公開されています。

<http://www.ihe-j.org/connectathon/index.html>

IHE-J コネクタソン

2008.10.27-31





DOMAIN		Radiology																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Modality	DSS/Order Filler	Order Placer	PPS Manager	Evidence Creator	Image Display	Image Manager/Archive	Acquisition Modality	DSS/Order Filler	Order Placer	PPS Manager

IHE-Japan Oct. 2008 Connectathon

IHE-Japan 2008 コネクタソン結果表

IHE-Japan 2008 コネクタソン 結果表

2009.3.20
有隣堂 中野 法人 日本IC協

| DOMAIN | Radiology | | | | | |
 | | | | Laboratory | |
 | | Cardiology | | | | IT Infrastructure
 | | | | | |
 | | | | | |
 | |
|---------|--|--|---|---|---|---
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---	---	---	---	---	---
---	---	---	---	---	---
---	--				
PROFILE	SWF	PIR	CPI	ARI	KIN
 | IRWF | LBL | LDA | POC | LTW | LTW-M
 | CATH | ECG | ECHO | ED | CT | PAM
 | PD-Q | XDS.a | XDS.b | XDS-I | |
 | | | | | |
 | |
| ACTOR | AIU
Image Display
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
AIU
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Print Component
Print Server
Image Display
Image Manager/Archive
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Image Display
Image Manager/Archive
Application Mobility
Print Component
Diplate
Image Display
Print Component
Portable Media Creator
Portable Media Director
Report Transfer
Image Manager/Archive
Importer
Order Filler
Label Broker
Label Information Provider
Automated Manager
Analyzer
PreWork Processor
Point of Care Unit Manager
Order Filler
Order Filler
Order Health Tracker
Order Filler
Order Filler
Order Health Tracker
AIU
Image Manager/Archive
Order Filler
Order Filler
PIS Manager
ESACAR
HPO-SIC
AIU
Image Display
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
Image Manager/Archive
Application Mobility
Image Client
Time Server
Patient Demographic Consumer
Patient Demographic Supplier
Patient Encounter Consumer
Patient Encounter Supplier
Patient Demographic Consumer
Patient Demographic Supplier
Document Consumer
Document Registry
Document Repository
Document Source
Document Consumer
Document Registry
Document Repository
Document Source
Document Registry
Document Repository
Image Content Consumer | AIU
Image Display
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
AIU
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Print Component
Print Server
Image Display
Image Manager/Archive
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Image Display
Image Manager/Archive
Application Mobility
Print Component
Diplate
Image Display
Print Component
Portable Media Creator
Portable Media Director
Report Transfer
Image Manager/Archive
Importer
Order Filler
Label Broker
Label Information Provider
Automated Manager
Analyzer
PreWork Processor
Point of Care Unit Manager
Order Filler
Order Filler
Order Health Tracker
Order Filler
Order Filler
Order Health Tracker
AIU
Image Manager/Archive
Order Filler
Order Filler
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AIU
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Patient Demographic Consumer
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Patient Encounter Consumer
Patient Encounter Supplier
Patient Demographic Consumer
Patient Demographic Supplier
Document Consumer
Document Registry
Document Repository
Document Source
Document Consumer
Document Registry
Document Repository
Document Source
Document Registry
Document Repository
Image Content Consumer | AIU
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Image Display
Image Manager/Archive
Application Mobility
Print Component
Print Server
Image Display
Image Manager/Archive
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Image Display
Image Manager/Archive
Application Mobility
Print Component
Diplate
Image Display
Print Component
Portable Media Creator
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Report Transfer
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Patient Demographic Consumer
Patient Demographic Supplier
Document Consumer
Document Registry
Document Repository
Document Source
Document Consumer
Document Registry
Document Repository
Document Source
Document Registry
Document Repository
Image Content Consumer | AIU
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Image Display
Image Manager/Archive
Application Mobility
Print Component
Print Server
Image Display
Image Manager/Archive
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Image Display
Image Manager/Archive
Application Mobility
Print Component
Diplate
Image Display
Print Component
Portable Media Creator
Portable Media Director
Report Transfer
Image Manager/Archive
Importer
Order Filler
Label Broker
Label Information Provider
Automated Manager
Analyzer
PreWork Processor
Point of Care Unit Manager
Order Filler
Order Filler
Order Health Tracker
Order Filler
Order Filler
Order Health Tracker
AIU
Image Manager/Archive
Order Filler
Order Filler
PIS Manager
ESACAR
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AIU
Image Display
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
Image Manager/Archive
Application Mobility
Image Client
Time Server
Patient Demographic Consumer
Patient Demographic Supplier
Patient Encounter Consumer
Patient Encounter Supplier
Patient Demographic Consumer
Patient Demographic Supplier
Document Consumer
Document Registry
Document Repository
Document Source
Document Consumer
Document Registry
Document Repository
Document Source
Document Registry
Document Repository
Image Content Consumer | AIU
Image Manager/Archive
Application Mobility
Order Filler
Order Manager
PIS Manager
Evidence Grader
Image Display
Image Manager/Archive
Application Mobility
Image Display
Image Manager/Archive
Application Mobility
Print Component
Print Server
Image Display
Image Manager/Archive
Evidence Grader
Image Display
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Patient Encounter Supplier
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(アルファベット順)

- 2008年度コネクタソンにおいて合格となったアクタ
- 2007年度コネクタソンの実績にもとづき合格となったアクタ

本結果表は、2008年10月に実施したIHE-J2008コネクタソンにおきまして実施したテストの結果を示したものです。コネクタソンでは、各プロファイル・アクタ毎に定めたテストを実施し、所定の基準に達したかどうかの判定をおこなっています。合格は、IHEに準拠したトランザクションを実装していることの証明ではありません。各社の製品の対応状況につきましては、各社で提供しているIHE統合宣言書(Integration Statement)をご覧ください。社名の右隣の●の箇所には、各社のIHE統合宣言書のWEBサイトへのリンクがはられています。

IHE を例えると: 定石



図2-4 上手な機器連携に定石あり 上手な将棋に定石が必要のように、上手な機器連携に IHE は役立ちます。

どの定石
(業務シナリオ)を使うかを検討して下さい。

分野別の最新トピックス(1)

- 放射線診断: Basic Image Review (BIR), MR Diffusion Imaging (MDI), PDI-Extension, Perfusion Imaging with Contrast (PIC)を検討
- 検体検査: PIRは、PAMに変更。External Laboratory Order (ELO)を検討
- 循環器: Implantable Device Cardiac Observation (IDCO)、Cardiology Data Handling (CDH)を検討
- 眼科: Legacy Acquisition Modality Importerを検討

分野別の最新トピックス(2)

- 放射線治療: Managed Delivery Workflow (MDW), Enterprise Schedule Integration (ESI) を検討
- 病理: ANATOMIC PATHOLOGY WORKFLOW (APW)、Anatomic Pathology Reporting to Public Health (ARPH)を検討
- 内視鏡: 日本が提案(ENDO)
- PCD: 日本麻酔科学会と検討中
- ITI: XDS.b, Asynchronous Web Services Exchange (AWSE)など。日本から3点確認を提案予定

Topics

- Integration Statements on www.ihe-j.org
- Product Registry
(at www.ihe.net)
- Connectathon 2009
 - NA: 68 vendors/ 116 systems
 - European: 59 vendors/ 92 systems
 - Japan: 39 vendors/ 81 systems
 - Australis, China, Malaysia

IHEの限界

- 医療機関にとって、医療情報システムをIHEだけで構築することは、残念ながら現状では困難です。
 - 手術システム、耳鼻科
 - 会計情報の扱い
 - レセプト処理
- IHEは、規格制定団体ではないので、必要な規格が制定されるまでは、望んだ業務シナリオが構築できないかもしれません。
- 自施設にぴったりの業務シナリオが無い時には、協力して作る努力が必要かもしれません。

IHE活動への参加

● 日本IHE協会の会員

- **A会員(団体)**: メーカー、学会、など
- **B会員(個人)**: IHE活動に興味のある個人

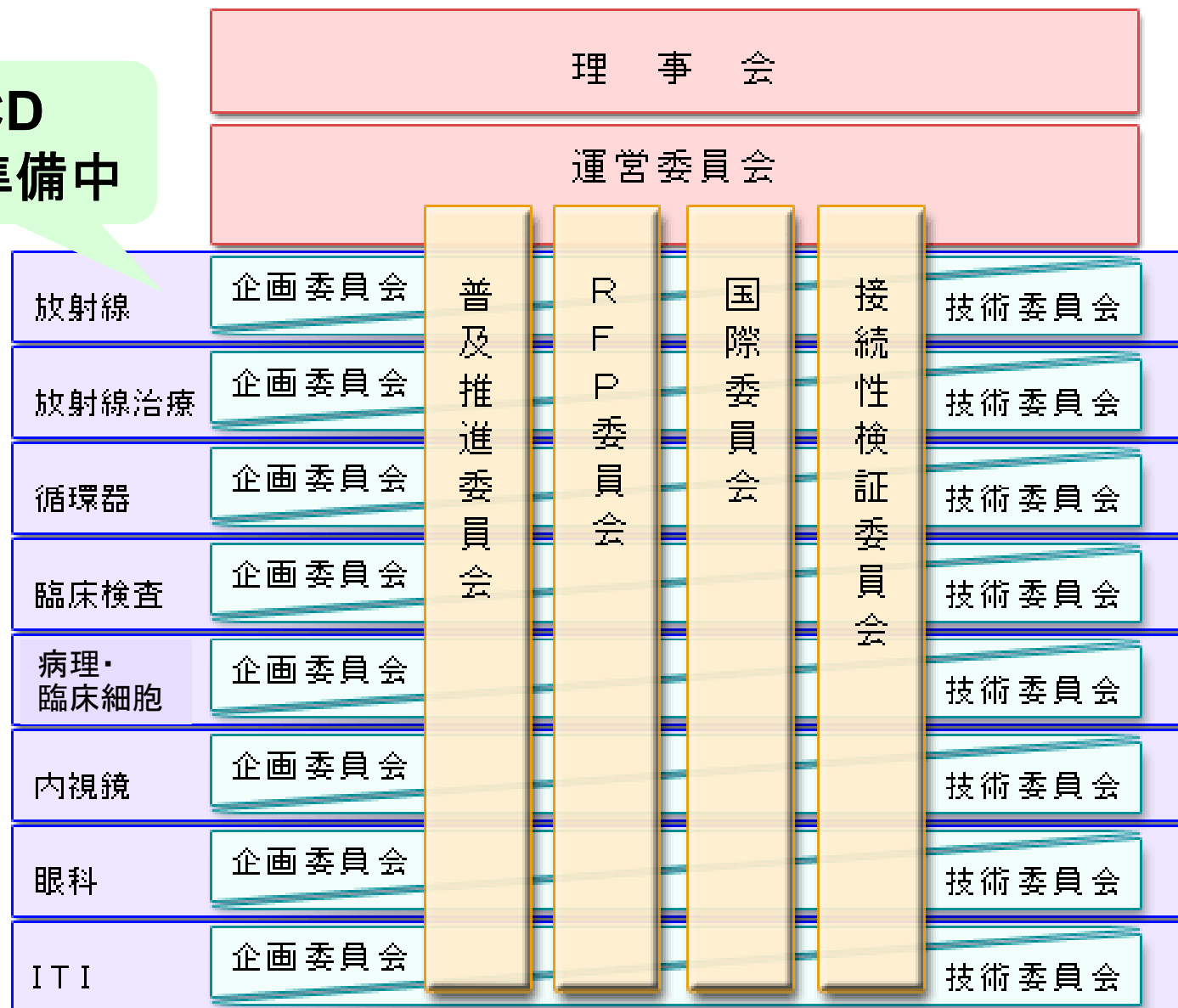
● IHEの委員会

- 各ドメインの委員会(放射線、放射線治療、臨床検査、循環器、病理、内視鏡、眼科、ITIなど)
- 領域によらない委員会(普及推進、接続性検証、国際、RFPなど)

● IHEに参加して、医療情報システムの連携を促進し、効率的な業務シナリオの普及を推進して下さい。

IHE-Jの専門分野

PCD
設立準備中





皆様の参加をお待ちしています。

IHEに何かしてもらうのではなく、IHEに参加して、
IHEを動かしましょう。





IHEは、医療におけるIT化を推進します。

Questions ?



WWW.IHE-J.ORG

WWW.IHE.NET