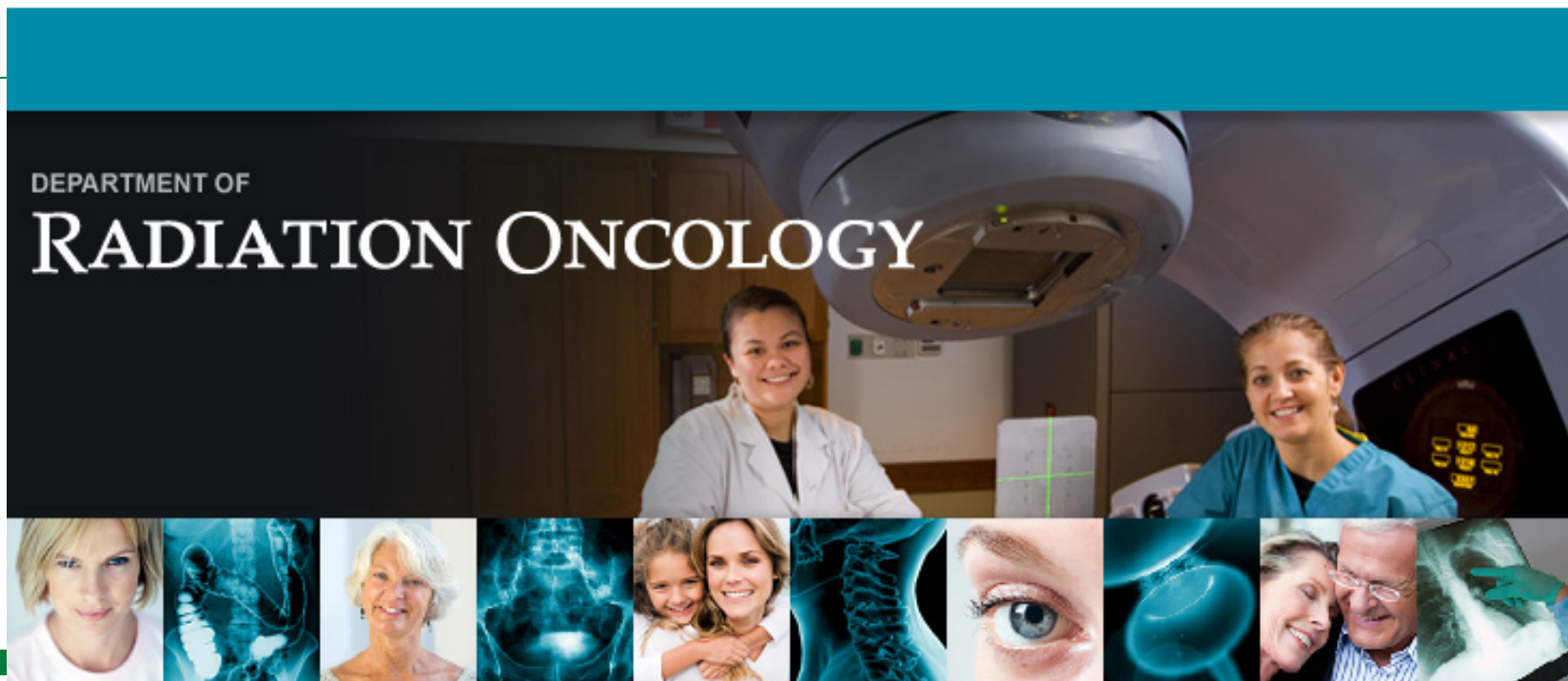




ICT Automatisering
INTERSYSTEMS

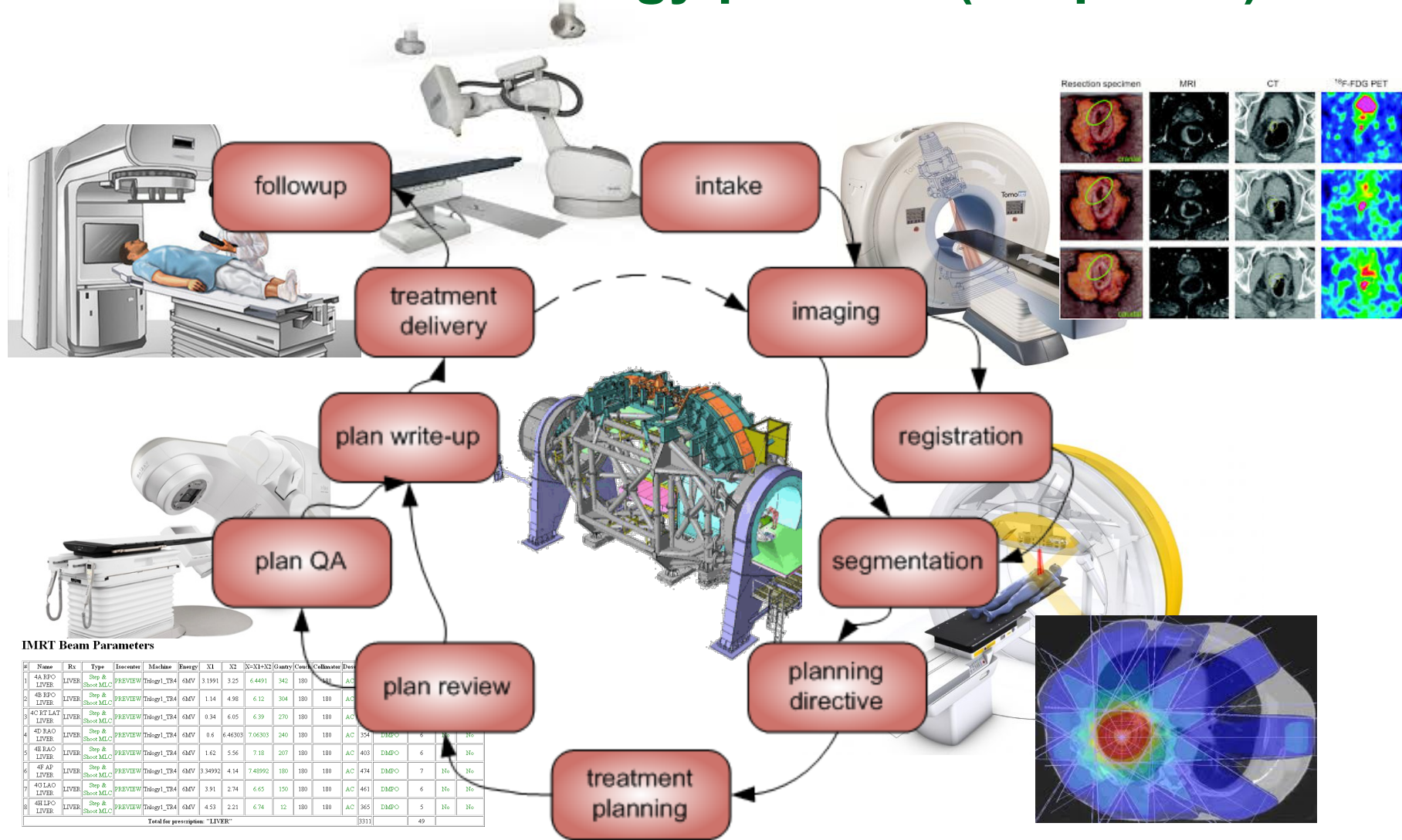


IHE in Radiation Oncology

Managed workflow in Radiation Oncology

- Introduction
 - Harold Beunk
 - Massachusetts General Hospital
 - ICT Automatisering
 - Intersystems
- Challenges of the (MGH) RO department
 - Complexity
 - Problem
- Information exchange, storage and management
 - IHE profiles & DICOM RT
- Workflows
 - IHE-RO profiles

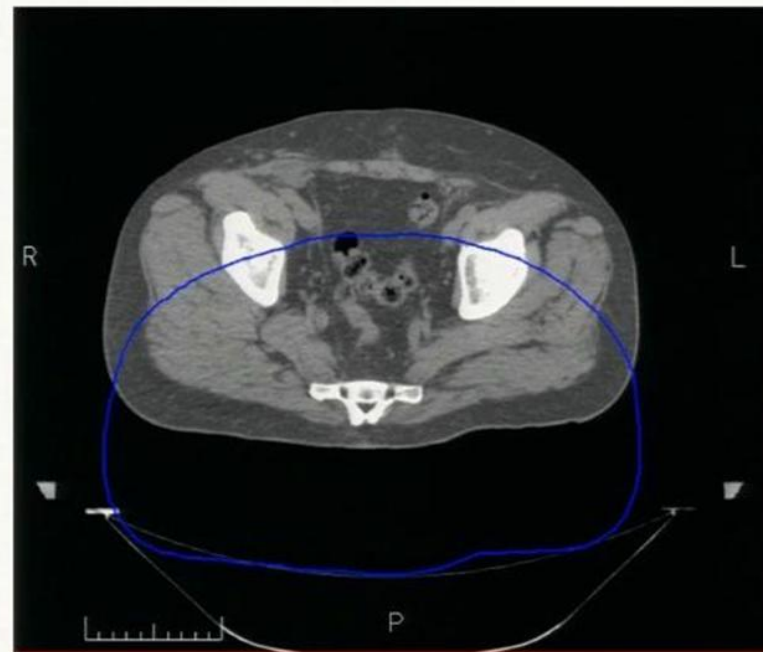
The radiation oncology process (simplified)



IMRT Beam Parameters

#	Name	Rx	Type	Isocenter	Machine	Energy	X1	X2	X1+X2	Qntry	Collimator	Dist
1	4A RPO LIVER	LIVER	Step & Shoot MLC	PREVIEW	Trilogy_L_T34	6MV	3.191	3.25	6.441	342	180	180
2	4B RPO LIVER	LIVER	Step & Shoot MLC	PREVIEW	Trilogy_L_T34	6MV	1.14	4.98	6.12	304	180	180
3	4C RT LAT LIVER	LIVER	Step & Shoot MLC	PREVIEW	Trilogy_L_T34	6MV	0.34	6.05	6.39	270	180	180
4	4D SAO LIVER	LIVER	Step & Shoot MLC	PREVIEW	Trilogy_L_T34	6MV	0.6	6.46303	7.06303	240	180	180
5	4E SAO LIVER	LIVER	Step & Shoot MLC	PREVIEW	Trilogy_L_T34	6MV	1.62	5.56	7.18	207	180	180
6	4F AP LIVER	LIVER	Step & Shoot MLC	PREVIEW	Trilogy_L_T34	6MV	3.34992	4.14	7.48992	180	180	180
7	4G LAO LIVER	LIVER	Step & Shoot MLC	PREVIEW	Trilogy_L_T34	6MV	3.91	2.74	6.65	150	180	180
8	4H LPO LIVER	LIVER	Step & Shoot MLC	PREVIEW	Trilogy_L_T34	6MV	4.53	2.21	6.74	12	180	180
Total for prescription: "LIVER"												
											5311	49

The Problem



Where we are Today (John Wolfgang, Hanne Kooy MGH)

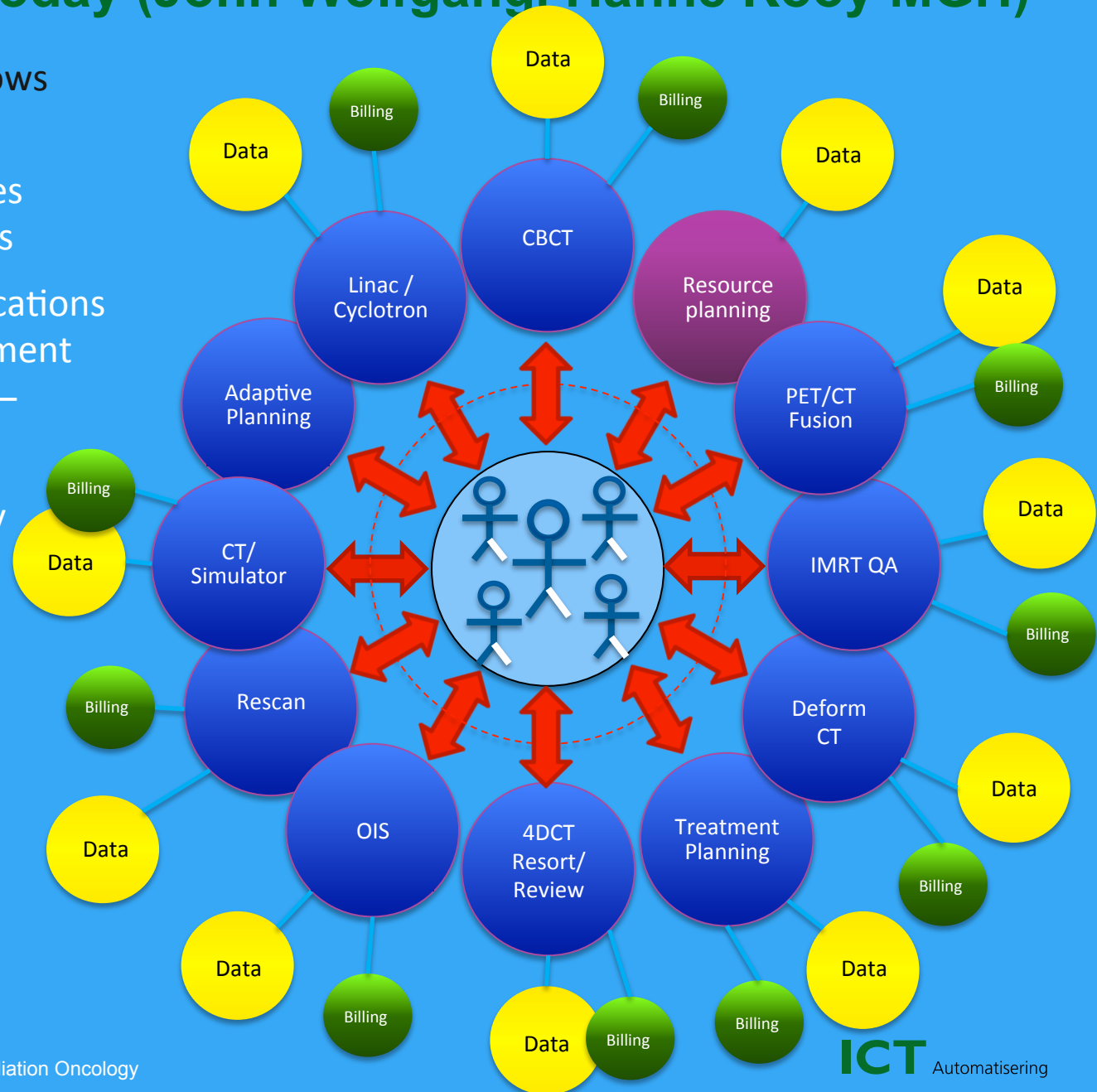
Decentralized local workflows

Each clinical action manages independent data instances

As number of clinical applications increases, human management burden scales significantly – **workload frustration**

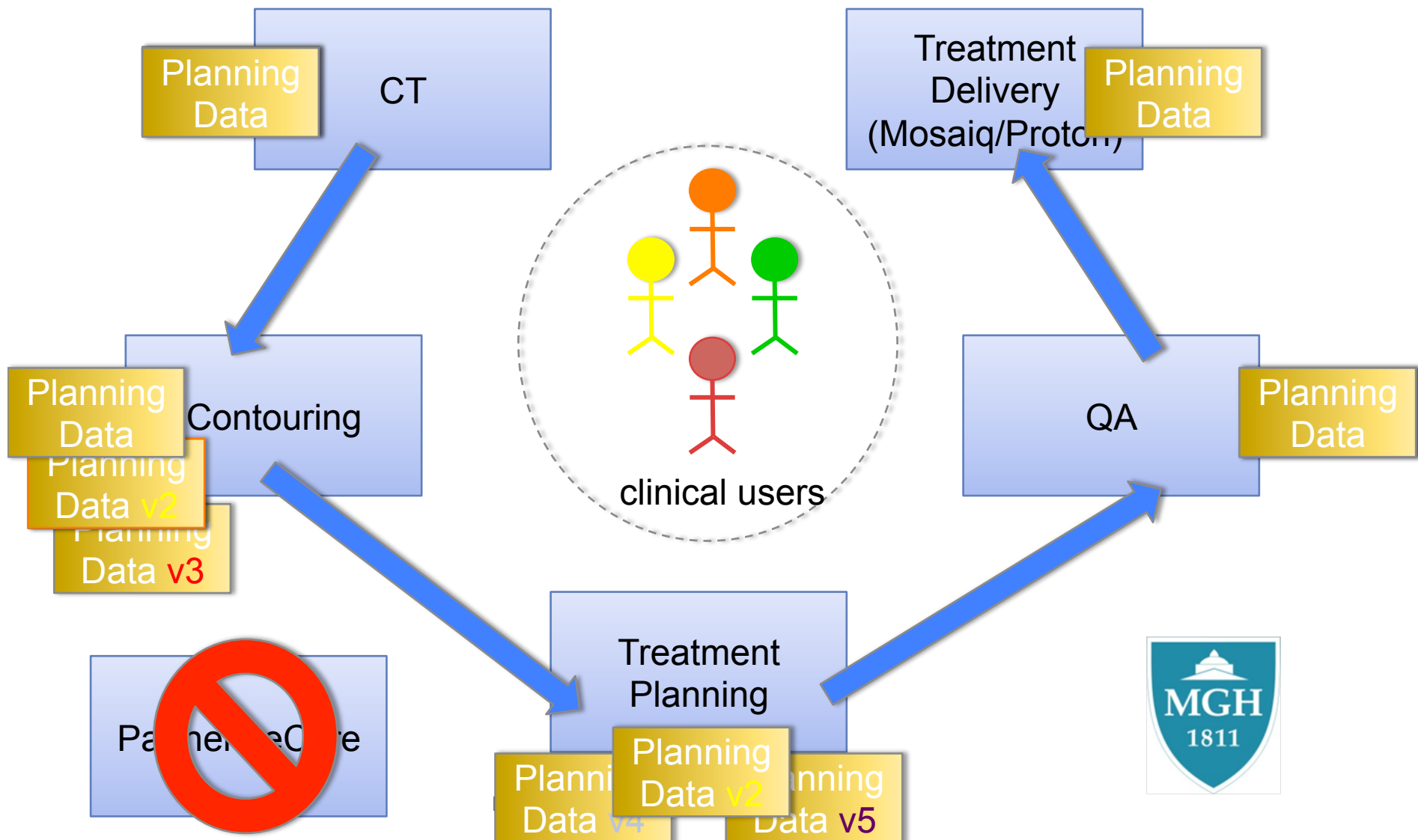
Clinical user must manually manage workflow and corresponding data

Data is only visible to all clinical users through system interfaces



Current Radiation Oncology Data Management

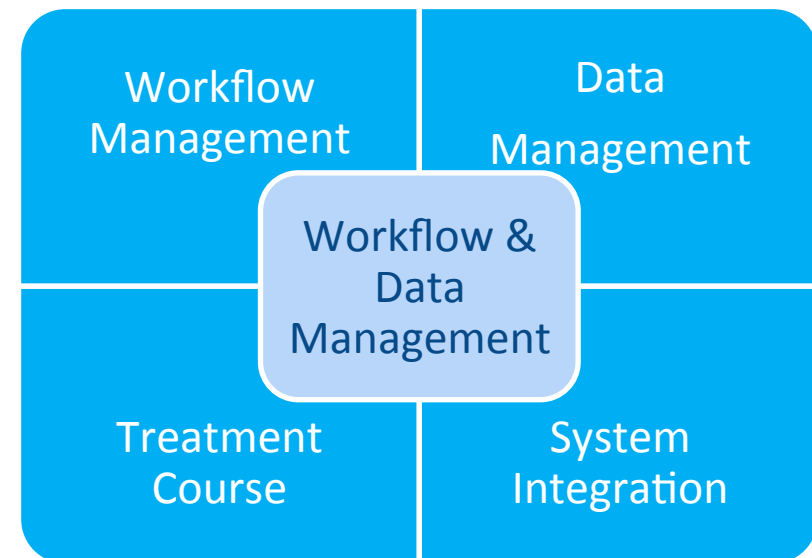
No single platform for all data types, multiple data types, multiple data sources, multiple data formats, multiple data owners, multiple data users, multiple data access points, multiple data access methods



Radiation Oncology Workflow & Data Management

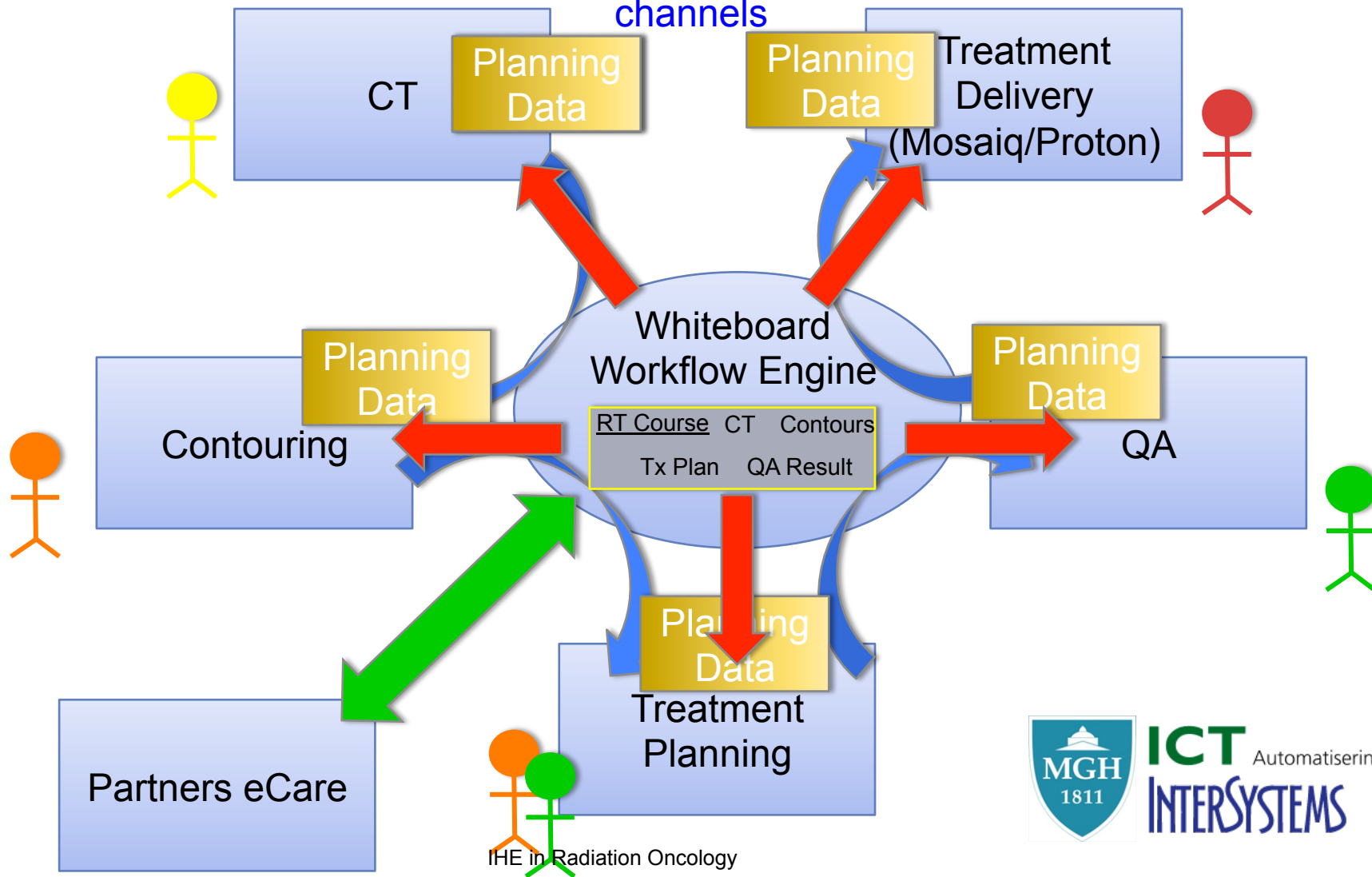
How this will be achieved:

- Workflow management by defining workflow steps for the clinical workflow
- Presentation of patient data and its clinical and functional context for each workflow step
- Management of all patient activities and data in a patient radiotherapy treatment course record
- Systems integration layer in the radiotherapy department, EMR, Treatment Planning and Treatment Delivery



Enhanced Workflow & Data Management

Whiteboard Workflow Engine (HLS) is a cloud-based engine, future Partners eCare (HLS) providing multiple connectivity channels



How IHE profiles can help the development

- Profiles on Infrastructure, Workflow, Content and Presentation
- Solutions for common IT problems
 - Authentication / security
- Use of best practices
 - Clinical workflows
 - Technology
 - Domain Specific
- Choice of standards
- Specifying behavior in actors and transactions
- Ensure interoperability, testable in connectathon
- Simplifies the integration and extension of systems

General IHE profiles



- ITI Domain
 - [CT] [Consistent Time](#)
 - [ATNA] [Audit Trail and Node Authentication](#)
 - [EUA] [Enterprise User Authentication](#)
 - [PDQ] [Patient Demographics Query](#)
 - [XDS] [Cross Enterprise Document Sharing](#)
- Radiology Domain
 - [SWF] [Scheduled Workflow](#)
 - [XDS-I.b] [Cross-enterprise Document Sharing for Imaging](#)
 - [PIR] [Patient Information Reconciliation](#)
 - [PAWF] Post-Acquisition Workflow



IHE-RO : Profiles (content & workflow)

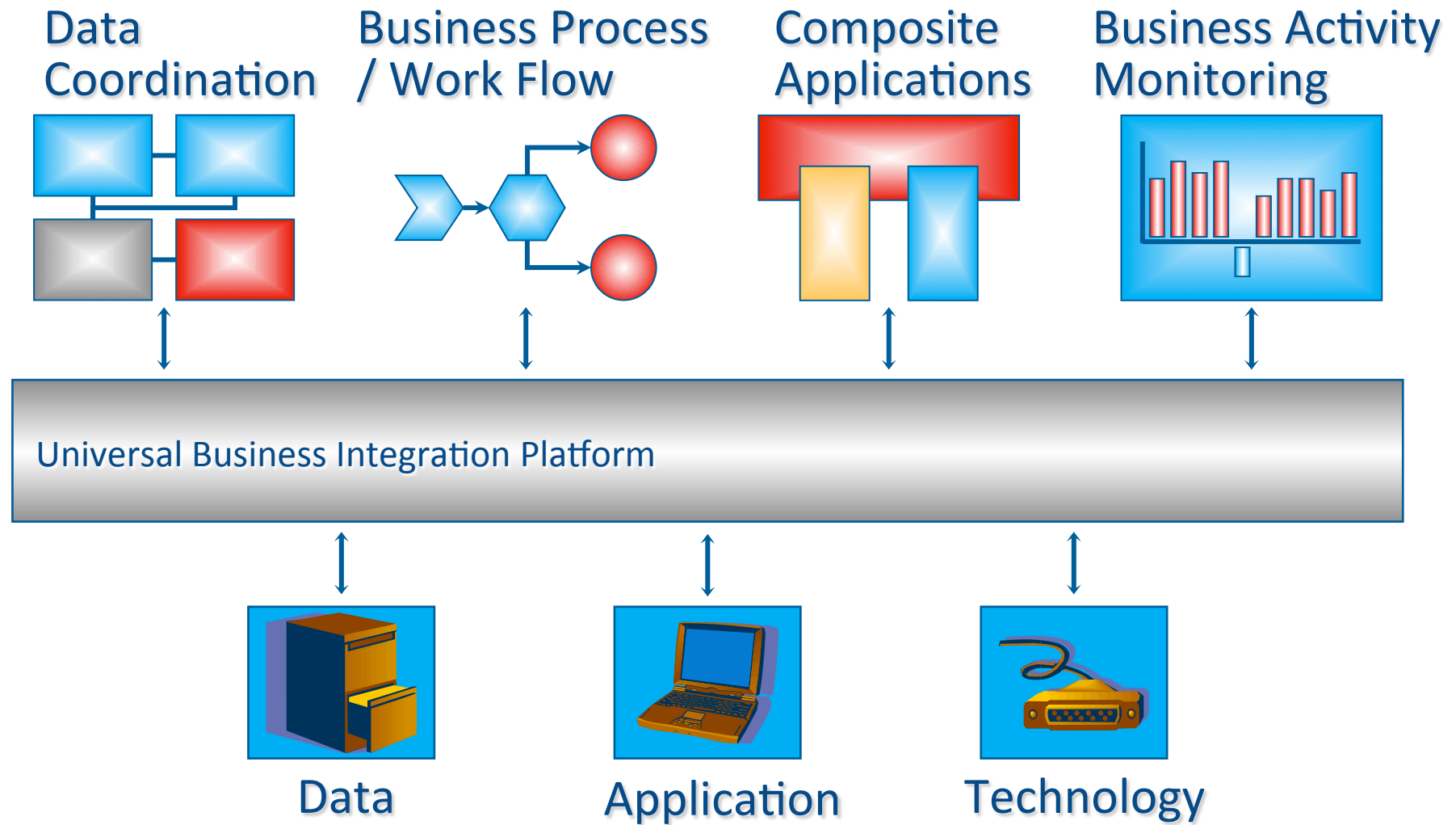
- Basic Radio Therapy Objects: BRTO
- Multimodality Image Registration Integration: MMRO:
 - MMRO II
 - MMRO III
- Advanced RT Objects Interoperability: ARTI
 - ARTI II
- Dose Compositing: DCOM
- Treatment Delivery Workflow TDW
 - TDW II
- Integrated Positioning and Delivery Workflow: IPDW
- Discrete Positioning and Delivery Workflow: DPDW
- Quality Assurance with Plan Veto :QAPV
- ROI templates 2012



<http://www.ihe-ro.org>

http://wiki.ihe.net/index.php?title=Radiation_Oncology

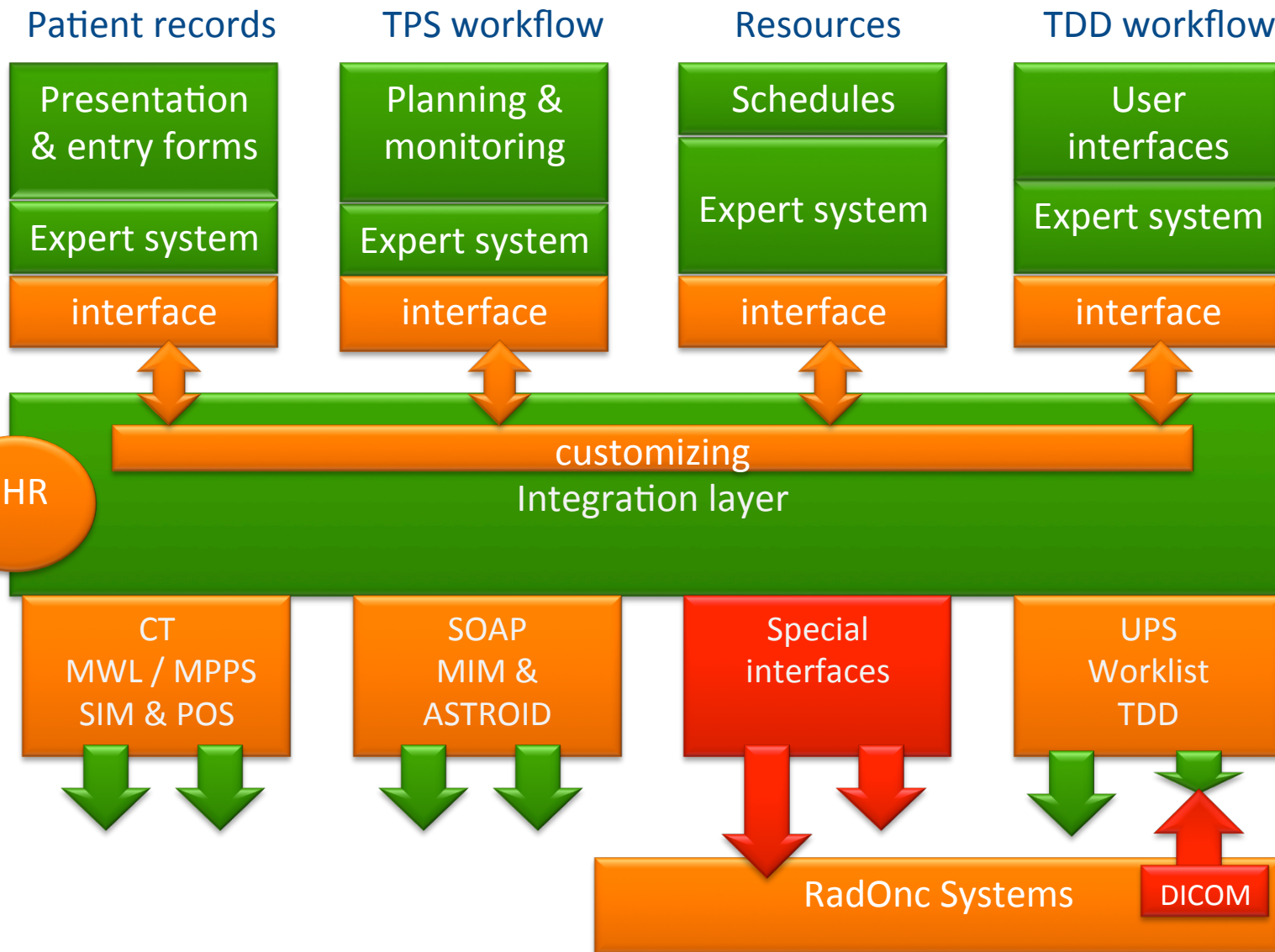
InterSystems Ensemble



Collaboration platform



INTERSYSTEMS



MGH statements (Order from in Chaos)

- ❑ RT IT is insular and does not leverage up-to-date technologies and methodologies
 - ❑ Enterprise architectures, Cloud ...
- ❑ Data structures, processes and evolution are dynamic and of considerable complexity
 - ❑ DICOM 2 / IHE-RO
- ❑ MGH wishes to “get a grip” on the above
- ❑ MGH & ICT: Concepts into Reality
- ❑ Safety! The “new” may have “side-effects”
 - ❑ ICT: Expertise in depth and outside
 - ❑ Leverage known technologies
 - ❑ Fit the solution to the problem
 - ❑ Standardize & Compartmentalize

Questions:



IHE Integrating
the Healthcare
Enterprise

INTERSYSTEMS



ICT Automatisering

Thank you