

2019 work report of CIMICS

CIMICS

November, 2019

Content

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- A yellow hand icon with a black sleeve, pointing its index finger to the right, positioned to the left of the first list item.
- 1 / WGs CIMICS Worked on
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Member Recruitment



Affiliated Hospital of Chengdu
University of traditional Chinese
Medicine

Total members of CIMICS: 23

WGs CIMICS focused



CP&SUP



Radlex



AI

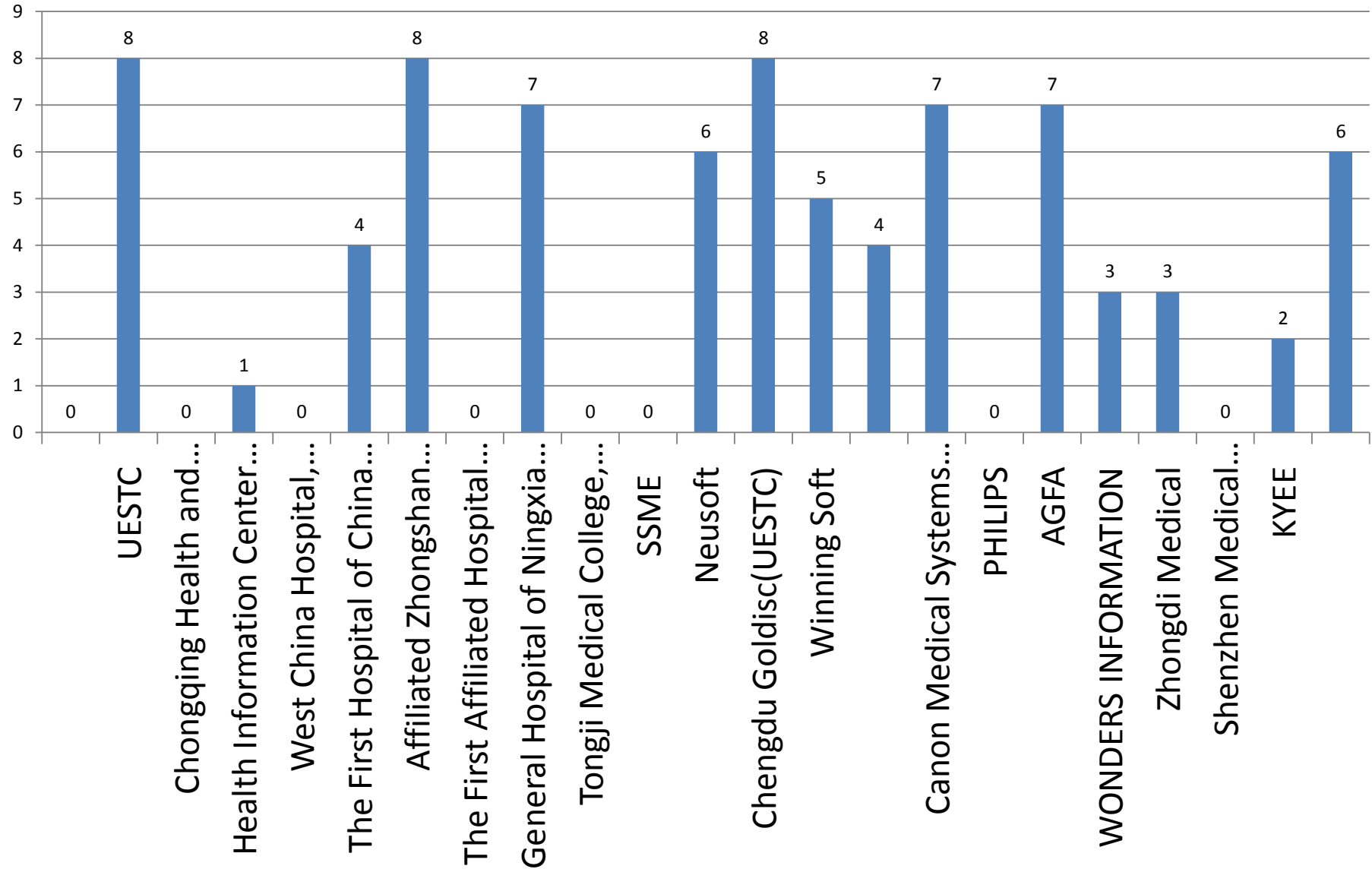


Conformance

CPs and SUPs voted

CPack-98		CPack-99:		CPack-100:		CPack-101:		CPack-102:		CPack-103			
	CP#		CP#		CP#		CP#		CP#		CP#	Title	
1.	991	20.	1626	47.	1551	65.	1875	75.	1808	85.	1614	将"/BulkData"和/Pixels 子资源添加到研究系列和实例	
2.	1663	21.	1674	48.	1552	66.	1874	76.	1865	86.	1721	离子束距离的澄清	
3.	1747	22.	1714	49.	1766	67.	1864	77.	1876	87.	1726	添加澄清注意事项, C-FIND SCP 应该忽略未知的标准和私有标记	
4.	1787	23.	1736	50.	1770	68.	1860	78.	1877	88.	1777	STOW-RS 中光度解释的起源	
5.	1788	24.	1764	51.	1835	69.	1859	79.	1878	Sup 投票:			
6.	1789	25.	1779	52.	1841	70.	1858	80.	1879	Sup#	Title		
7.	1790	26.	1793	53.	1842	71.	1857	81.	1880	Sup175	二代放射疗法 - C-手臂 RT 医疗模式		
8.	1791	27.	1797	54.	1843	72.	1856	82.	1882	Sup202	实时影像		
9.	1792	28.	1807	55.	1844	73.	1854	83.	1883	Sup208	3D 制造和虚拟现实 OBJ 模型的 DICOM 封装		
10.	1794	29.	1810	56.	1845	74.	1839	84.	1884	SUP176	二代放射疗法 - 体层摄影治疗 - 多种固定源和机器手臂治疗模式		
11.	1795	30.	1811	57.	1846	添加 ROI 距离坐标测量值的描述			96.	1886	添加缺失的经直肠到超声光束路径上下文组		
12.	1796	31.	1812	58.	1847	用 SNOMED 代码替换限定的 I			97.	1888	基于 VR 的所有其他编码的反向检测, 以遵循新 VR 的规则		
13.	1798	32.	1813	59.	1848	限制未来 VRs 只使用大写字母			98.	1890	添加更多肾血管		
14.	1799	33.	1814	60.	1849	为引用区域的相应血流量和体积			99.	1891	增加血管超声背景组缺失的一般超声心电图测量值		
15.	1801	34.	1815	61.	1850	脑肿瘤分割码			100.	1892	体表面积代码的正确代码含义		
16.	1802	35.	1816	62.	1851	将之前 RT 式的 SNOMED ID 改			101.	1893	修复不一致的关系内容约束(来自增补 164 SR IODs)		
17.	1803	36.	1817	63.	1853	添加封装文档的长度(如果不是			102.	1894	添加转位分子蛋白质示踪剂		
18.	1804	37.	1818	64.	1855	添加"所有模式"语境组			103.	1895	在文件中添加 DULP 和 Web 服务的表示地址		
19.	1809	38.	1819	移除重复辐射事件 UID 代码						104.	1899	框架属性的数目不应有零值	
		39.	1820							105.	1900	无法解压缩时使用 WADO-RS 传输语法	
		40.	1821							106.	1901	在查询响应中返回可用于检索的传输语法	
		41.	1822							107.	1902	一些 IODs 缺少同步模块	
		42.	1823										
		43.	1824										
		44.	1825										
		45.	1826										

Members voted



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Framework

概述

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简介

产品描述

服务和互用性描述

DICOM 结构

网络交流详述

安全性

备用表

- 验证
- 存储
- 工程流程管理
- 问题/恢复
- 印刷
- De-识别剖面图
- 安全概述

- 应用数据流图
- 应用实体的功能定义
- DICOM标准的延伸

- 应用实体服务的测图
- **支撑服务**
- 明确的字符集
- 支撑De-识别剖面图

- 基本参数
- Alt1 - 工作清单服务布局
- Alt1 - MPPS 服务布局
- Alt1 - 存储服务布局
- Alt1 - 存储委托服务布局
- Alt1 - 问题/恢复 服务布局
- Alt1 - 印刷服务布局
- Alt1 - 统一工作清单和程序步骤服务 (UPS) 布局
- Alt1 - 有效实例通知服务 (IAN) 布局
- Alt1 - WADO-URI网站服务布局
- Alt1 - WADO-RS 网站服务布局
- Alt1 - STOW-RS 网站服务布局
- Alt1 - QIDO-RS网站服务布局
- Alt2 - 同在一个表格中的本地AET布局
- Alt2 - 同在一个表格中的远程AET布局

• 总概

• **AE1**

• 处理错误

• 附录

• **A.信息对象定义**

• **B.制定报告编码**



版本：2018年第一版 V1.0

DICOM一致性声明改进

DICOM Conformance Statement Improvements

Total: 127 pages

国际DICOM 标准委员会 (DSC) 编著
国际DICOM标准中国委员会 (CIMICS) 翻译
二零一八年五月七日

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Research

No.	level	Project Name	Participating unit
1	National	Research and Application of Health Management Service platform for the elderly based on Health Cloud	UESTC、West China Hospital、 Chengdu GOLDISC
2	Provincial	Research and Application demonstration of Medical Image quality Evaluation system based on Cloud platform	West China Hospital、 Chengdu GOLDISC
3	Provincial	3D Navigation system of Spinal minimally invasive Robot based on Medical Image	UESTC、West China Hospital、 Affiliated Hospital of Chengdu University of traditional Chinese Medicine、 Chengdu GOLDISC
4	Provincial	Key supporting Technology and industrialization of Medical Digital Image Communication	UESTC、West China Hospital、 Chengdu GOLDISC

Research

Clinical Application of AI Big Data

■ Bone Age Test

- 高精度

诊断精确到0.1岁,和专家医生计算的骨龄值的平均绝对误差不超过0.3岁。

- 高效率

产品读片+诊断+自动生成报告一共是3秒/病人,比医生的15分钟读片时间提速300倍。

- 高稳定

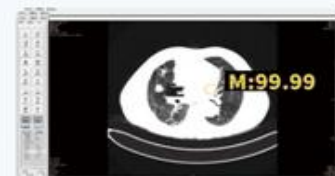
大样本测试下读片判断标准始终稳定一致。



■ Pulmonary Nodule Screening

- 预处理模块

对肺部的3D分割和重建算法,可以处理不同CT成像设备在不同成像参数条件下产生不同源数据。



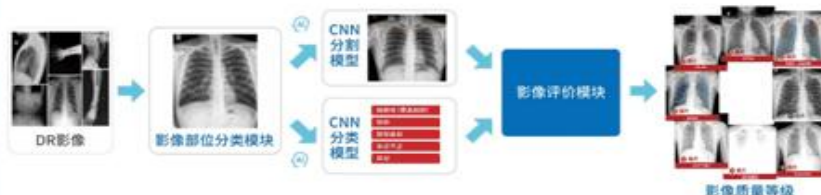
- 识别模块

- ① 3D卷积神经网络实现结节检测;
- ② 肺结节良恶性分类 (B代表良性, M代表恶性)。



■ DR Quality Control

辅助提高基层技师医学影像成像规范化和标准化水平,助力放射医学质控管理。

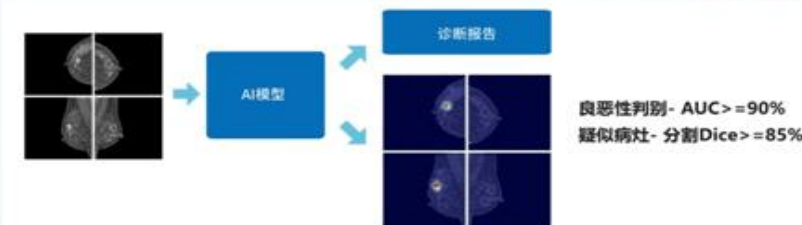


■ AI Screening of Breast Molybdenum Target X-ray Image

AI技术辅助诊断,精准阅片

- 智能化识别疑似病灶定位;
- 乳腺良恶性判别;

- BI-RADS等级评估;
- 自动生成报告。



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Annual meeting of CIMICS in 2019



Topics Discussed

01

The radiation examination project needs to provide a set of technical coding structure.

02

How to solve the problem of AI-PACS data interaction specification?

03

Does the SNOMED and DICOM standard be inconsistent with the definition of the abdominal cavity?

04

What do you think of the current development of CFDA YY/T standards?

05

PACS security protocol?

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Virtual print information interaction specification of medical digital imaging



The first Hospital of China medical university
University of Electronic Science and Technology of China
Statistical Information Center of National Health Commission
LANWON science and technology Co. Ltd.

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Suggestion

1. Film printing requirements in China

- **Large population VS insufficient medical resources and uneven distribution**
- **In the next 10 to 20 years, film will still be the main carrying and interactive medium for medical imaging.**
- **The demand for film printing has also expand quickly, but scattered printing in the hospital has brought it a great waste of human, material and financial resources.**
- **The hospital of China proposed the centralized film printing, instant printing, on-demand printing, cloud printing etc., and need management of film printing to reduce the cost of film printing**
- **Since 2007, Chinese medical equipment suppliers and PACS manufacturers have launched virtual printing solutions to meet the above requirements in order to meet the above requirements.**

2. Virtual Printing Chaos in China

- **Lack of unified specifications, products cannot be interconnected**

As there are no standardized standards for reference, virtual print service providers cannot commercialize this service and can only adopt personalized custom development.

- **Virtual printing system is self-contained and mutually incompatible**

The solutions provided by virtual printing service providers (including PACS manufacturers, film self-service printing equipment vendors, etc.) are self-contained and incompatible with each other.

- **Binding different PACS vendors and self-service equipment vendors**

- **It is common for hospitals to repeatedly purchase virtual printing service systems**

In order to solve different printing needs, the hospital was forced to purchase multiple sets of different virtual printing service systems, causing waste of resources and increasing the integration and management complexity of the hospital information system.

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Suggestion

1.Dicom Printing Standard Changed

Compared to DICOM standard before **2004**, now DICOM printing standard made some adjustments:

In [Basic Film Session SOP Class], Canceled [**Proposed Study Sequence**]

In [Basic Grayscale Image Box SOP Class], Canceled [**Original Image Sequence**]

PS. [Proposed Study Sequence] before 2004

Attribute Name	Tag Usage	SCU/SCP
Proposed Study Sequence	(2130,00A0)	U/U
>Patient's Name	(0010,0010)	U/U
>Patient ID	(0010,0020)	U/U
>Patient's Birth Date	(0010,0030)	U/U
>Patient's Sex	(0010,0040)	U/U
>Patient's Birth Time	(0010,0032)	U/U
>Other Patient ID	(0010,1000)	U/U
>Other Patient Names	(0010,1001)	U/U
>Ethnic Group	(0010,2160)	U/U

1.Dicom Printing Standard Changed

Attribute Name	Tag Usage	SCU/SCP
>Patient Comments	(0010,4000)	U/U
>Study Instance UID	(0020,000D)	U/U
>Study Date	(0008,0020)	U/U
>Study Time	(0008,0030)	U/U
>Referring Physician's Name	(0008,0090)	U/U
>Study ID	(0020,0010)	U/U
>Accession Number	(0008,0050)	U/U
>Study Description	(0008,1030)	U/U
>Name of Physician(s) Reading Study	(0008,1060)	U/U
>Admitting Diagnoses Description	(0008,1080)	U/U
>Patient's Age	(0010,1010)	U/U
>Patient's Size	(0010,1020)	U/U
>Patient's Weight	(0010,1030)	U/U
>Occupation	(0010,2180)	U/U
>Additional Patient's History	(0010,21B0)	U/U
>Series Number	(0020,0011)	U/U

1.Dicom Printing Standard Changed

PS. [Original Image Sequence] before 2004

Attribute Name	Tag Usage	SCU/SCP
Original Image Sequence	(2130,00C0)	U/U
>Study Instance UID	(0020,000D)	MC/M
>Series Instance UID	(0020,000E)	MC/M
>Patient ID	(0010,0020)	MC/M
>Referenced SOP Class UID	(0008,1150)	MC/M
>Referenced SOP Instance UID	(0008,1155)	MC/M
>Referenced Frame Number	(0008,1160)	MC/M
>Instance Number	(0020,0013)	MC/M

1.Dicom Printing Standard Changed

Influence:

- All current DICOM print communications do not include any basic information and examination information fields for the patient
- The service was unable to obtain matching information required for archiving from regular print communications or from received print data

2.Dicom Printing Standard Changed

Influence:

- **All current DICOM print communications do not include any basic information and examination information fields for the patient**
- **The service was unable to obtain matching information required for archiving from regular print communications or from received print data**

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Suggestion

1. Virtual Printing Standard Overview

ICS 11.000
C 07

WS

中华人民共和国卫生行业标准

WS/T 597—2018

医学数字影像虚拟打印信息交互规范

Virtual print information interaction specification of medical digital imaging

2018 - 04 - 17 发布

2018 - 10 - 01 实施

中华人民共和国国家卫生健康委员会 发布

- Followed by and DICOM standard(2011) and GB/T 1.1-2009.

- Proposed by the Information Standards Professional Committee of the CHINA National Health Standards Committee and CIMCIS.

- Drafted by The First Affiliated Hospital of China Medical University, University of Electronic Science and Technology, Statistical Information Center of National Health and Family Planning Commission, CIMCIS, etc.

- Published by China National Health Committee on 17th Apr, effect on 1st Oct.

2. Technical Framework

- According to the DICOM standard, implement the DicomPrintSCP role and complete the virtual print reception



DICOM Print SCU



Virtual print service

- **Category I Archiving:** Get film matching information by parsing the DICOM field in the Print communication process.

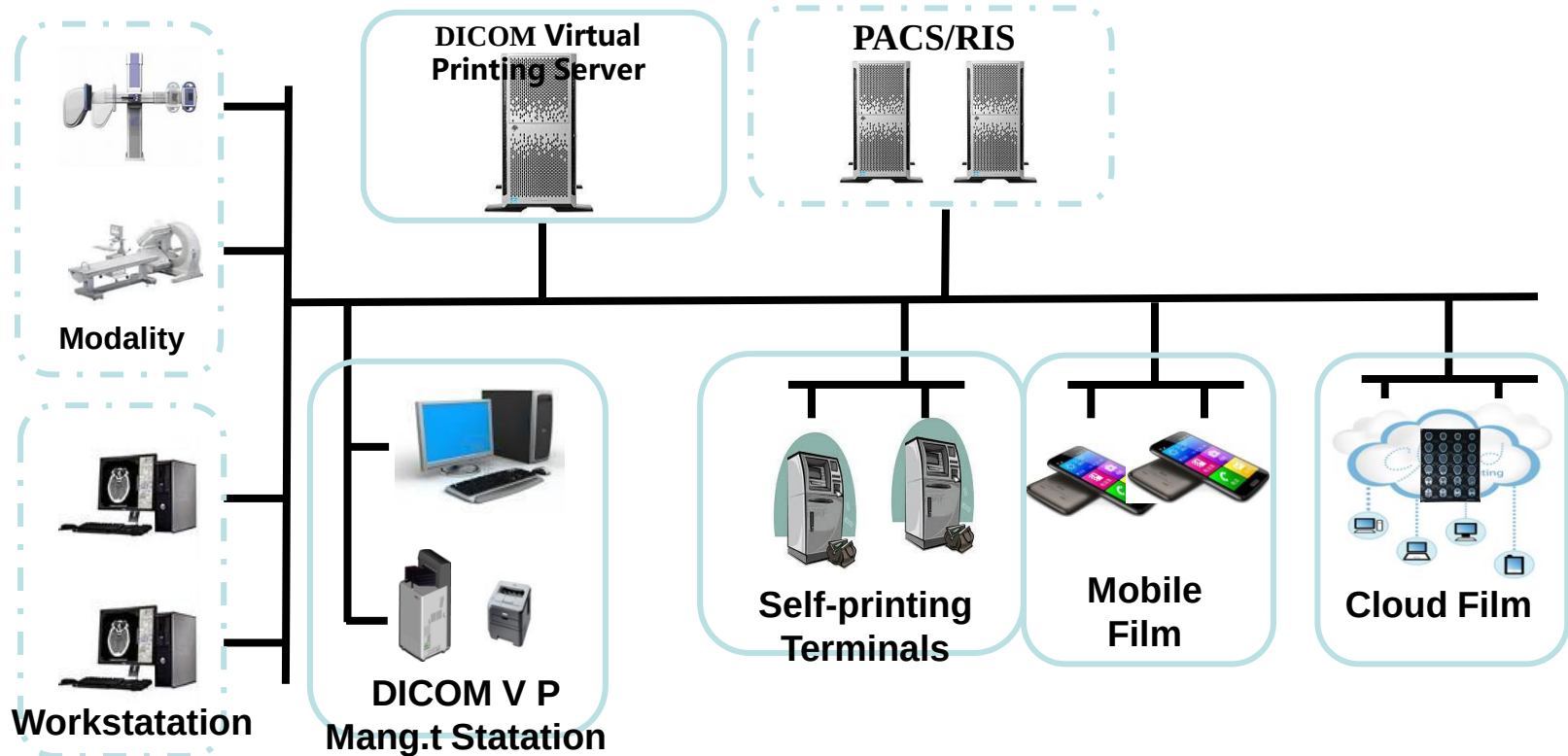
The SCP needs to attempt to parse the following fields during the print session:
Additional field: Study Instance UID (recommended)
Additional Sequences: Referenced Study Sequence

- **Category II Archiving :** The film matching information in the received DICOM file is extracted by image recognition(OCR).

If the SCP fails to parse the required fields, it uses image recognition technology to extract information such as PatientID, AccessNumber, etc. from the received Dicom film file.

3.Workflow and Scenario

Applicable to the software development of various types of medical and health institutions, medical equipment manufacturers, medical image storage and archiving systems (PACS) and radiological information system (RIS) manufacturers at all levels.



4.DICOM Print SCP mandatory content

The virtual print service DICOM PRINT SCP must have the following capabilities:

- 一、 Communication with DICOM PRINT SCU following DICOM standard
- 二、 Parse archive information from the following request packets
 - a.Film Session N-CREATE-RQ
 - b.Film Box N-CREATE-RQ
 - c.Image Box N-SET-RQ

Archived information includes:

Additional field: Study Instance UID (recommended)

Additional Sequences: Referenced Study Sequence

- 三、 Image recognition patient information

When the SCU cannot send additional information, the inspection information is obtained through image recognition(OCR) for archiving.

5.DICOM Print SCU mandatory content

If DICOM PRINT SCU needs to use the virtual print service, it must meet at least one of the following conditions

一、 Archive information can be added to the following request packets :

- 1.Film Session N-CREATE-RQ
- 2.Film Box N-CREATE-RQ
- 3.Image Box N-SET-RQ

Archived information includes:

Additional field: Study Instance UID (recommended)

Additional Sequences: Referenced Study Sequence

二、 Typesetting displays PatientID and AccessNumber, and fixed position

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Suggestion

1. West China Hospital



2. Radiology Department of WCH

- 1.80 million patients VS 65 employees
- 5000 studies per day
- 150T data per year
- 30 self printing printer

2. A Medical Accident Related to Self Printing

- **Vendor:** An international provider
- **Accident:** 300+ patients got wrong film
- **Reason:** Virtual Printing OCR error
- **OCR Error:** Software update with different typesetting

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Suggestion

Suggestions

- DICOM standard support patient information like [Patient ID] in the new version
- Explore the possibility of virtual printing CP into DICOM standard

Annual work report of CIMICS



Thank You !