Medical Imaging Workstation: CAF Views

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Abstract

The Customer objectives, Application and Functional views are described. The radiology department and the radiologist are the main customer. The clinical and the financial context of the radiology department is shown. The medical imaging workstation is positioned in the field of IT products and in the clinical workflow. The market segmentation is shown. The typical URF examination is explained. Key drivers are linked to application drivers and to product requirements. The functionality development over time is shown and the role of the information model for interoperability is discussed.

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August 21, 2020 status: finished version: 1.4



The clinical context of the radiology department







The financial context of the radiology department





Application layering of IT systems





Reference model for healthcare automation

information handling	entirely distributed <i>wide</i> variation due to "socio-geographics": psycho-social, political, cultural factors	archiving
imaging and	image handling	
treatment localised patient focus safety critical <i>limited</i> variation due to "nature": human anatomy pathologies imaging physics	distributed <i>limited</i> variation due to "nature": human anatomy pathologies imaging physics	service business not health care specific extreme robust fire, earthquake, flood proof life time 100 yrs (human life)
	base technology	
not health care specific short life-cycles rapid innovation		



Clinical information flow





URF market segmentation



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Typical case URF examination



examination room: average 4 interleaved examinations / hour

image production: 20 1024² 8 bit images per examination

film production: 3 films of 4k*5k pixels each



high quality output (bi-cubic interpolation)



Timing of typical URF examination rooms



version: 1.4 August 21, 2020 MICAFtypicalTiming



Key drivers, application drivers and requirements

Customer key drivers	derived Application drivers		Requirements
report quality	selection of relevant material use of standards	$\left \bigcap \right $	import auto-print parameterized layout
diagnostic quality	acquisition and viewing settings contrast, brightness and resolution of light-box		spooling storage navigation / selection auto-delete viewing
safety and liability	clear patient identification left right indicators follow procedures freeze diagnostic information	many to	contrast / brightness zoom annotate export <i>functionality</i>
cost per diagnose	interoperability over systems and vendors multiple images per film minimise operator handling multiple applications per system	many	system response system throughput image quality annotation material cost operational cost
time per diagnose	diagnose at light-box with films all preparation in exam room		qualities shared information model viewing settings
		\bigvee	patient, exam info interfaces



Retrospective functionality roadmap





high innovation rate



high interoperability



Coverage of submethods of the CAF views

Customer objectives	Application	Functional
	context diagram	case descriptions commercial decomposition service decomposition goods flow decomposition function and feature
business models	stakeholders and concerns entity relationship models	specifications performance external interfaces
suppliers	dynamic models	standards

legendexplicitly addressedaddressed only implicitlynot addressedcoverage based on documentation status of first product release

