Good Health Care Needs Good Health Informatics Education
On Safeguarding IT Investments Through High-Quality Education

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Saudi e-Health Conference 2008 - Towards National eHealth
17 March 2008, Riyadh, Saudi Arabia

structure of this talk

- on IMIA
- on health informatics education
- examples
- Why safeguarding IT investments through high-quality education?
- remarks

some references (+ www.plri.de)

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on IMIA

on IMIA, the International Medical Informatics Association, www.IMIA.org

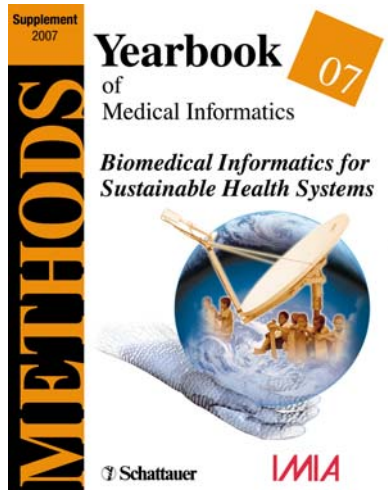
- objectives
  - promotion of informatics in healthcare and biomedical research
  - advancement of international cooperation
  - stimulation of research, development and education
  - dissemination and exchange of information

on IMIA, the International Medical Informatics Association, www.IMIA.org

- in 1967: initial founding twelve nations

on IMIA, the International Medical Informatics Association, www.IMIA.org

- in 1967: initial founding twelve nations
- today:
  - IMIA is a worldwide network of National Member Societies, Academic Institutions, …
  - 85 nations (52 full, 33 correspond. members),
  - 48 academic institutions shaping and practicing high-quality education, …
  - IMIA's national member societies represent over 50,000 individuals in all continents
  - IMIA is privileged to be the only NGO of WHO in the eHealth space



on IMIA, the International Medical Informatics Association, www.IMIA.org

- today:
  - IMIA is a worldwide network of National Member Societies, Academic Institutions, …
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  - IMIA's national member societies represent over 50,000 individuals
  - IMIA is privileged to be the only NGO of WHO in the eHealth space
- Welcome to IMIA!
  SAHI is national member since 2007

on health informatics education

Methods of Information in Medicine
© F. K. Schattauer Verlagsgesellschaft mbH (2000)

International Medical Informatics Association, Working Group 1: Health and Medical Informatics Education

Recommendations of the International Medical Informatics Association (IMIA) on Education in Health and Medical Informatics

Abstract: The International Medical Informatics Association (IMIA) agreed on international recommendations in health informatics/medical informatics education. These should help to establish courses, course tracks or even complete programs in this field, to further develop existing educational activities in the various nations and to support international initiatives

Methods Inf Med 2000; 39: 267-77. www.IMIA.org translated in Chinese, Czech, Italian, Spanish, Turkish

health informatics education - why?

1. Progress in information processing and IT is changing our societies.
2. The amount of health and medical knowledge is increasing. We cannot hope to manage it without using new information processing methodology and IT.
3. There are significant economic benefits from the use of IT to support medicine and health care („a 50-60 billion € market“).
4. The quality of health care is enhanced by the systematic application of information processing and IT.

health informatics education - why?

5 It is expected, that these developments will continue.

6 Health care professionals, who are well-educated in health informatics / medical informatics are needed to systematically process information in medicine and health care, and for the appropriate and responsible application of IT.

7 Through an increase in scope and the provision of high quality education in health informatics / medical informatics, well-educated health care professionals world-wide are expected to raise the quality and efficiency of health care.

health informatics education - how?

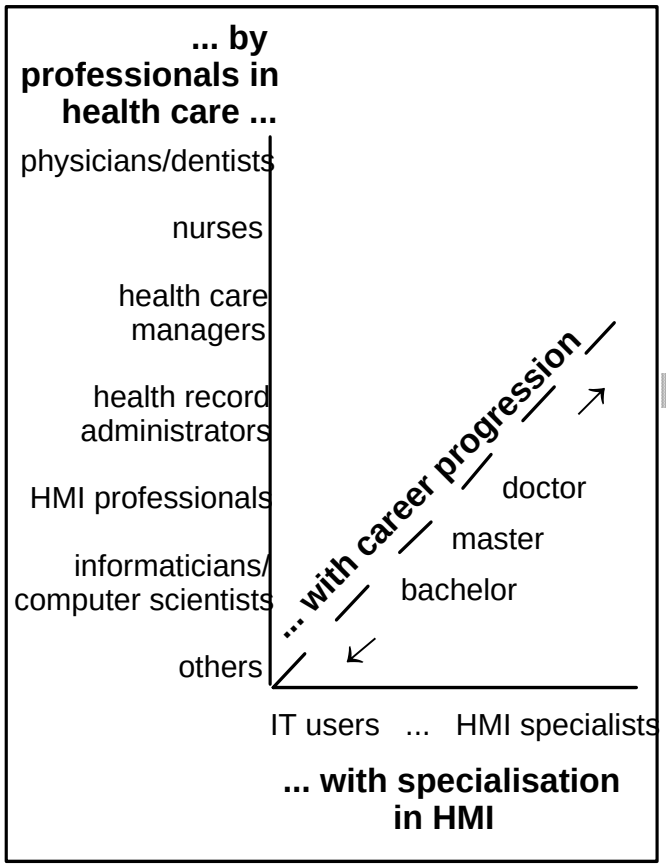
key principles: HEALTH

in order to provide good quality health care, health / medical informatics (HMI) education in HMI is needed:

H for various health care professions
E in different modes of education,
A with alternate types of specialisation in HMI
L at various levels of education, stages of career progression; there must be
T qualified teachers and
H recognised qualifications for HMI positions

health informatics education - how?

knowledge and skills needed in health and medical informatics



... lead to ...

learning outcomes

... for students ...

in
- medicine/dentistry
- nursing
- health care management
- health record administration
- informatics/computer science

(courses/course tracks in HMI as part of educational programs)

in
- dedicated HMI programs

(dedicated educational programs in HMI)

... and have to be transformed into educational components with appropriate depth and breadth

health informatics education - how?

... for IT users

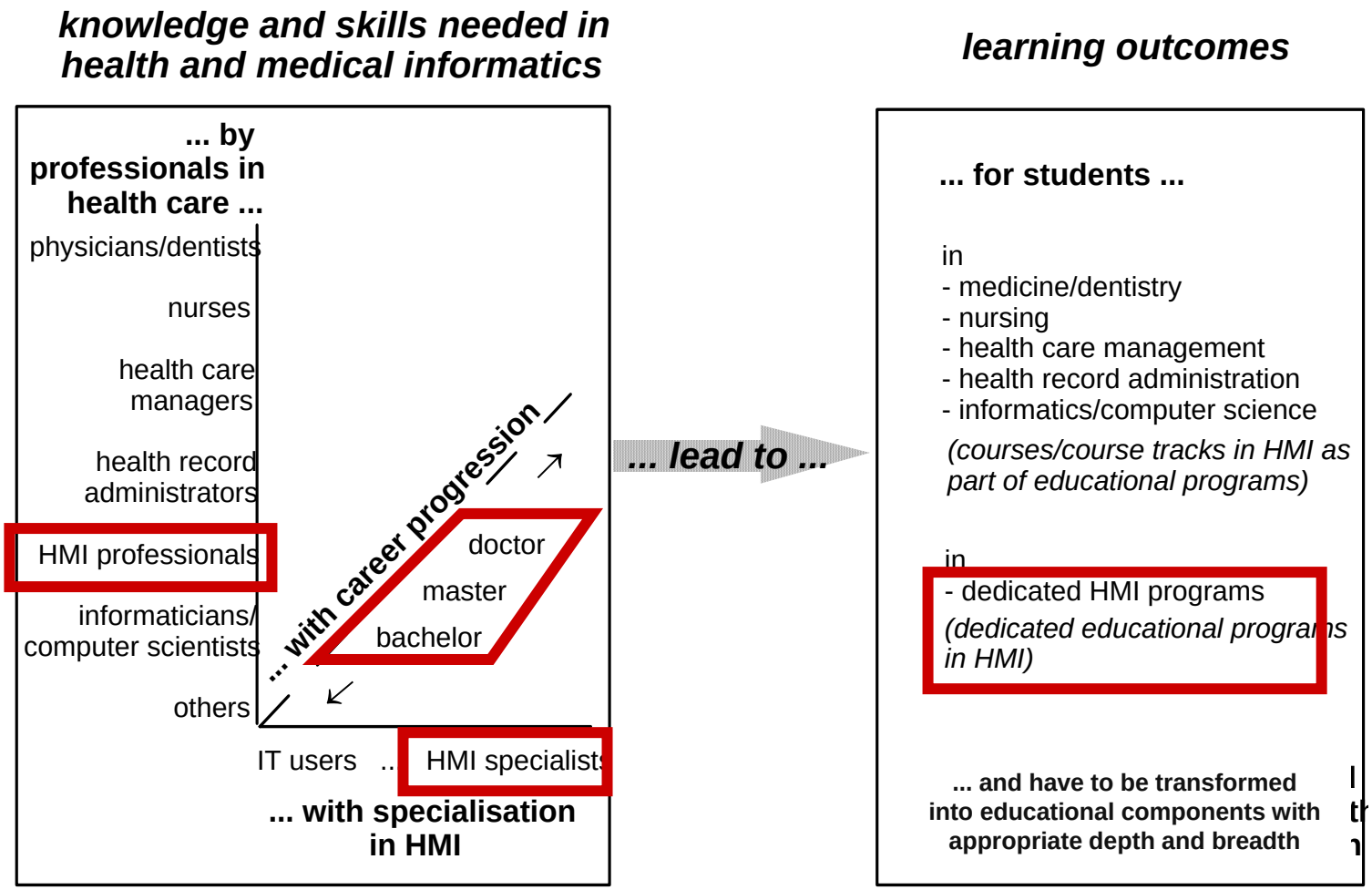
- aim: to efficiently and responsibly *use* information processing methodology and IT
- these need to be included in all undergraduate curricula, leading to a qualification for health care professionals

health informatics education - how?

...for HMI specialists

- aim: preparing graduates for *HMI careers* in academic, health care (e.g. hospital) or industrial settings
- these need to be included in all curricula, leading to a qualification as specialist in HMI

health informatics education - how?



health informatics education
two approaches for HMI specialists

- *informatics-based approach* to HMI: To focus on the need for advanced knowledge and skills of health and medical informatics, of mathematics, as well as of theoretical, practical and technical informatics/computer science.
- The objective of a *health care-based approach* to HMI is to focus, apart from knowledge in health and medical informatics, also on knowledge in medicine or of other health sciences.

new IMIA recommendations on education core contents for HMI specialists

- *work in progress! maybe subjective focus*
- processing of data, information and knowledge in medicine and healthcare
  - health information systems and management
  - structure, design and analysis principles of the health record
  - practice evaluation and evidence based practice/evidence based medicine
  - …

new IMIA recommendations on education core contents for HMI specialists

- *work in progress! maybe subjective focus*
- medicine, health and biosciences, health system organisation
  - diagnostic and therapeutic strategies and medical decision making
  - organisation of health institutions and of the overall health system, interorganizational aspects, shared care
  - …

new IMIA recommendations on education core contents for HMI specialists

- *work in progress! maybe subjective focus*
- informatics / computer science, mathematics, biometry
  - informatics basics like data, information, knowledge, hardware, software, computer, networks, information systems, information systems management

  …

new IMIA recommendations on education core contents for HMI specialists

- *work in progress! maybe subjective focus*
- optional modules
  - public health informatics
  - clinical bioinformatics and computational biology
  - biomedical imaging and signal processing
  - medical nanoinformatics and robotics
  - health enabling technologies, ubiquitous health systems and ambient assisted-living

examples

examples for dedicated HMI programs

- these programs lead to a dedicated HMI degree in health informatics / (bio)medical informatics
- duration, typically
  - Bachelor: 3 years (180 ECTS credits)
  - Master: 2 years (120 ECTS credits)
  - Ph.D.: 4 years

mapping the two approaches to curricula

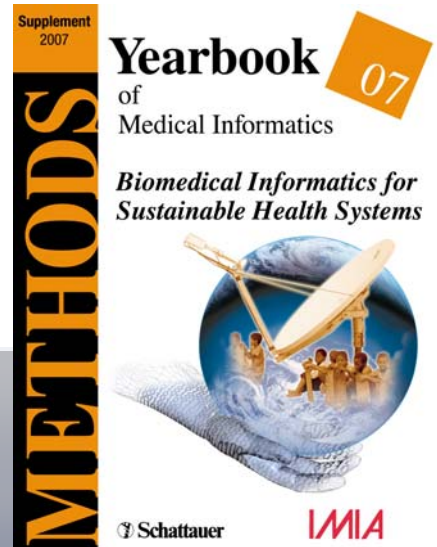
informatics-based approach to HMI:

Bachelor (e.g. Victoria, Amsterdam, …)
Master (e.g. Minnesota, Utah, Amsterdam, KSAU-HS…)
Ph.D. (most universities with HMI research)

health care-based approach to HMI

Master (e.g. Minnesota, Utah, KSAU-HS, …)
Ph.D. / M.D. (most universities with HMI research)

more programs e.g. at www.IMIA.org and in the IMIA Yearbook



three decades medical informatics education at Braunschweig and Hannover

- 1969 P.L. Reichertz became professor at Hannover Medical School
- 1975–1988 minor subject medicine at computer science program of University of Braunschweig,
- today: joint Peter L. Reichertz Institute for Medical Informatics with a wide spectrum of medical informatics education, including dedicated curricula on the B.Sc., M.Sc. and Ph.D level

Prof. Reichertz
1930 - 1987

medical informatics programs at the Peter L. Reichertz Institute (PLRI)

- dual degree in computer science and medical informatics possible on the
  - bachelor level (3 years, dual degree if 50 out of 180 ECTS credits are from medical informatics courses)
  - master level (2 years, dual degree if 50 out of 120 ECTS credits a from medical informatics courses)
- informatics-based approach
- optional: Ph.D

PLRI - bachelor (medical) informatics

area	semester 1	semester 2	semester 3	semester 4	semester 5	semester 6	
informatics	programming I 4 credits techn. informatics I 4 credits theo. informatics I 4 credits algor. & data str. 8 credits	programming II 6 credits techn. informatics II 4 credits theo. informatics II 5 credits	SW engineering 10 credits (4+6) HW-/SW-systems 4 credits operating systems 4 credits database systems 4 credits	computer networks 4 credits	6 credits 4 credits	15 credits	122
mathematics	linear algebra 8 credits discr. mathematics 4 credits	analysis 8 credits logic 4 credits	math. I 4 credits	mathe II 4 credits			32
minor			16 credits minor subject medicine				16
key qualific.		key qualific. 5 credits			key qualific. 5 credits		10
ECTS credits	32	32	28	30	31	27	180

16 credits in medical informatics (of totaling 36 credits)

PLRI - bachelor (medical) informatics

courses:

- introduction to medical informatics
- health information systems A
- med. documentation, knowledge representation and study design
- biomedical signal and image processing

area	semester 1	semester 2	semester 3	semester 4	semester 5	semester 6	
	programming I	programming II	SW engineering 10 credits (4+6)		MIS P 6 credits seminar 4 credits	Bachelor thesis 15 credits	122
		matics II	HW-/SW-systems 4 credits				
		matics II	operating systems 4 credits	computer networks 4 credits			
			database systems 4 credits				
			introduction to medical informatics	health information systems A	medical documentation, knowledge representation & study design	biomedical signal and image processing	
	sis		math. I 4 credits	mathe II 4 credits			32
minor			medicine I	medicine II	health systems	selected topics of medicine	16
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minor subject:

- medicine I
- medicine II
- health systems
- selected topics of medicine

PLRI - bachelor (medical) informatics

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key qualific.		key qualific. 5 credits			key qualific. 5 credits		10
ECTS credits	32	32	28	30	31	27	180

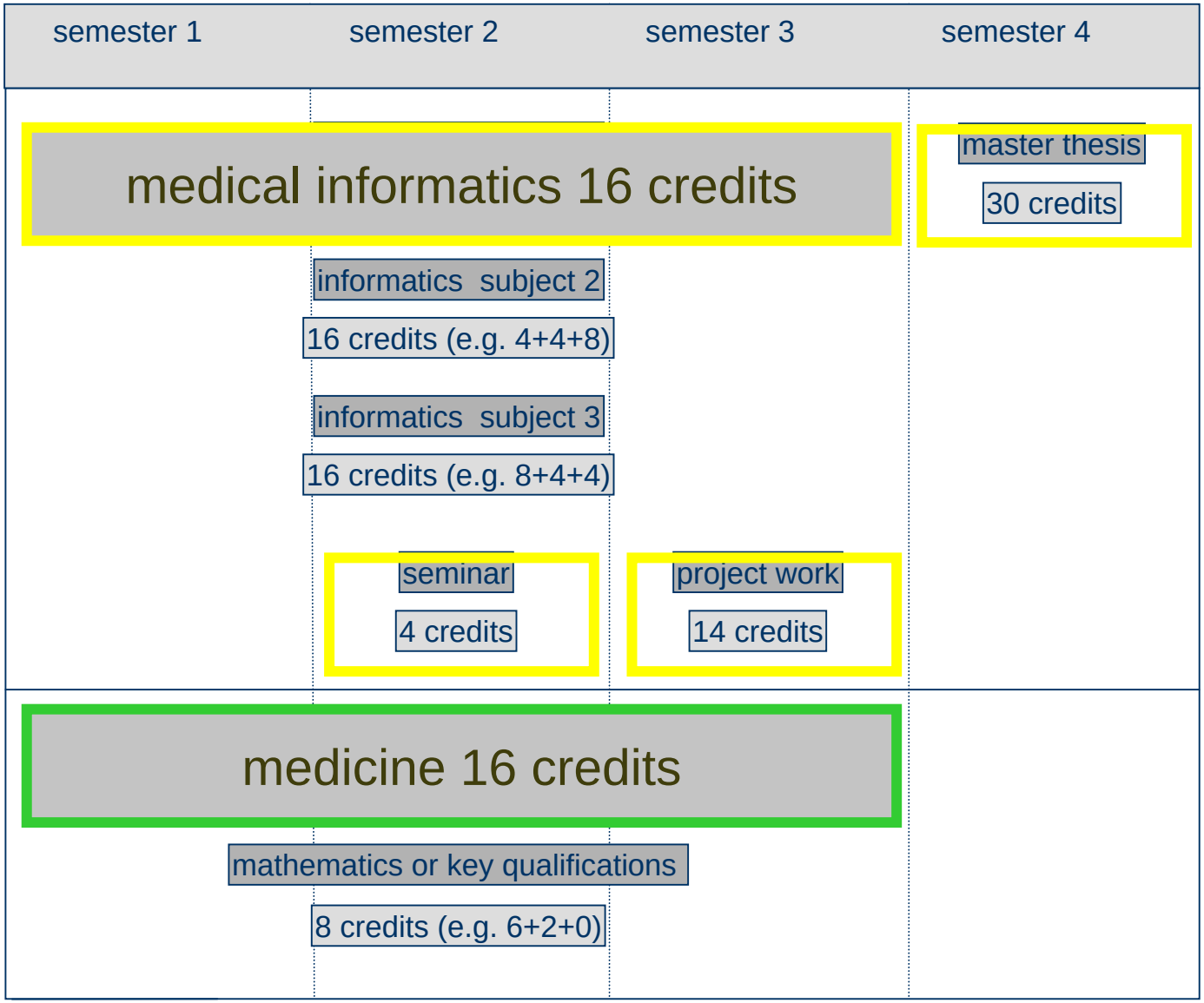
and additionally:

seminar

team project

bachelor thesis

PLRI - master (medical) informatics



PLRI - master program

- medical informatics tracks
  - health information systems track
    modules: strategic information management - Frank van Swieten lectures, med. documentation, knowledge representation and study design, …
  - health enabling technologies track
    health enabling technologies A, B, …
  - selected topics in medical informatics
- modules in minor medicine (4 ECTS each)
  - selected topics in medical methodology I, II
  - selected topics in clinical medicine I, II

international education

Frank-van Swieten lectures on strategic information management in hospitals (Methods 2005, IJMI 2004)

2006 Braunschweig

2007 Amsterdam

Why safeguarding IT investments through high-quality education?

health informatics education - why?

6 Health care professionals, who are well-educated in health informatics / medical informatics are needed to systematically process information in medicine and health care, and for the appropriate and responsible application of IT.

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health informatics education - experience

- positive experience since more than three decades in those countries, where health / medical informatics education is established
- excellent job perspectives for graduates
- but ...

  ... only if high quality education with qualified teachers, sufficient resources for research and good link to practice

remarks

health informatics education - achievements

- first dedicated programs started in the late 1960ies, early 1970ies
- today about 50 academic members in IMIA („tip of the iceberg“)
- approved int. recommendations on health/medical informatics education (www.imia.org)
- there exist several approaches for educating HMI specialists
- excellent job perspectives

education and IMIA's goals

Finally, that IMIA provides an example for the successful, tolerant and peaceful collaboration among individuals, across and beyond our nations and cultures, for the sake of good health and quality of life achievable for the people of our world.

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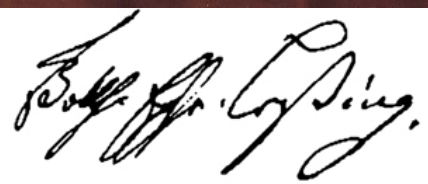

Gotthold Ephraim Lessing (1729-1781)
Nathan the Wise - Ring Parabel
www.Gutenberg.org/etext/3820

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