

WORLD CONGRESS OF HEALTH PROFESSIONS
THE FUTURE NOW:
CHALLENGES AND OPPORTUNITIES IN HEALTH
Perth Convention Exhibition Centre
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Western Australia



Healthcare Information Technology Security: Survey Instrument Development

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Outline

- Prior Research
- O.E.C.D. Principles of Security
- O.E.C.D. scale developed & validated in the US
- Site #1
- Site #2
- Australian Survey
- Next Steps
- Contact details



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Prior Research

- *Creating a Culture of Security* Internal Auditor, Vol. LX, No. III, June 2003 pp.37-41.
- *Ensuring security in Healthcare Information Systems*, Nursing in a Technological World, Conference Handbook, Queensland University of Technology, Brisbane, Australia, p. 179. June 2003.



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U. S. Content Validation Study

- *Measuring the Culture of Security in Healthcare Information Systems*, Nursing in a Technological World, Conference Handbook, Queensland University of Technology, Brisbane, Australia, p. 93. June 2003 *

* Collaborating Partners:

Elmhurst Hospital Center & New York Medical College



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Organization for Economic Cooperation and Development

- Headquartered in Paris
- 30 Member Nations
- Economic Policies
- www.oecd.org
- **OECD Guidelines for the Security of Information Systems & Networks**

Towards a Culture of Security



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1. AWARENESS

Participants should be aware of the need for security of information systems and networks and what they can do to enhance security.

- Required Management Action:
Promulgate Policies & Support Staff
- Possible Measurement: Existence of
Statements & Publicity



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2. RESPONSIBILITY

All participants are responsible for the security of information systems and networks.

- Required Management Actions: Assign Responsibilities and Authority
- Possible Measurement: Job Descriptions and Systems/Network Managers



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3. RESPONSE

Participants should act in a timely and co-operative manner to prevent, detect and respond to security incidents.

- Required Management Actions: Required Reporting on Breaches of Security
- Possible Measurement: Reports and Help Desk Actions



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4. ETHICS

Participants should respect the legitimate interests of others.

- Required Management Action: Organizational Codes of Conduct
- Possible Measurement:

Existence of Codes

Training

Enforcement



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5. DEMOCRACY

The security of information systems and networks should be compatible with essential values of a democratic society.

- Required Management Action: Statements on the rights of Individuals
- Possible Measurement: Guidance on Information Flows and Decision Making



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6. RISK ASSESSMENT

Participants should conduct risk assessments.

- Required Management Action: Reviews of Systems Risks
- Possible Measurement: Audit and Quality Control Functions



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7. SECURITY DESIGN AND IMPLEMENTATION

Participants should incorporate security as an essential element of information systems and networks.

- Required Management Action: Systems Development Life Cycle Methodology
- Possible Measurement: Budgets and Plans That Reflect SDLC



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8. SECURITY MANAGEMENT

Participants should adopt a comprehensive approach to security management.

- Required Management Action: Established Security Policies
- Possible Measurement: Policy Statements and Assignment of Responsibilities



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9. REASSESSMENT

Participants should review and reassess the security of information systems and networks, and make appropriate modifications to security policies, practices, measures and procedures.

- Required Management Action: Review of Plans and Results
- Possible Measurement:
Continuous Improvement



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Problems With the OECD Guidelines

- Never Validated
- No Known Factor Analysis
- No Attitudes and Values Measurement Scales
- No Systematic Application to Measure



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OECD scale developed and validated in the US

- Used for Research and Development
in:

Self-efficacy – Changing Behaviour
Attitudes & Values Scale



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Sample of Attitudes & Values Scale

The following questions ask you to express your personal view of the level of support by the health care organization towards the security of its information systems. Concern for computer security means things like raising awareness, assigning responsibilities and reporting problems when you or others become aware of them. Please read each question and then circle the number that best describes how you feel about what is being asked in the question.

	Circle one number on each line										
Do you feel that in your health care organization:	Strongly Disagree			Agree					Strongly Agree		
	0	1	2	3	4	5	6	7	8	9	10
1. People in the organization recognize that with all new technology there is a need for constant monitoring of new security threats and vulnerabilities.											



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Site # 1-Characteristics

- Westchester, NY-suburban/rural area
- 120 licensed beds-Acute care facility
- 700 employees/300 in nursing services
- NURSING STAFF
 - 58% BS
 - 30% hold national certification in specialty
- About to embark on new information system venture for clinical documentation



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Descriptive Statistics

All Female	Age	Years in Health Care	N Subjects
Managers	47	23.8	8
Staff	45.9	22.1	16
Combined	46.3	22.7	24



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Site 2

- 235 licensed beds, not-for-profit acute care hospital
- Suburban setting in Westchester county, New York
- Using clinical computer applications since 1991



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Sites #1 & #2 - Attitudes & Values Scores

	<u>Mean</u>	<u>Standard Deviation</u>
*Managers	7.07	1.82
*Staff	6.78	1.54
Combined	6.88	1.61

* Site # 1 only



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Australian Content Validation

- Background:
- 4 Questions X 9 Guidelines = 36 Q's
- Content Validated
- Used for Research and Development in:
- Self-efficacy – Changing Behaviour
- Attitudes & Values



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Content Validation Experts

- Eight Educators & Administrators
 - 19 ³/₄ Average Years of Experience
 - 4 Professional Discipline Educators
 - 4 Hospital / Clinic Directors



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Australian Content Validation

Reference:

- Original content validation source:

Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research*, 35 (6), 382-385.

- A review article still confirming Lynn's format as the appropriate one to use:

DeVon, H. A., Block, M. E., Moyle-Wright, P., Ernst, D. M., Hayden, S. J., Lazzara, D. J., Savory, S. M., & Kostas-Polston, E. (2007). A psychometric toolbox for testing validity and reliability. *Journal of Nursing Scholarship*, Second Quarter, 155-164.



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Survey instrument on the web

- Hosted by TSG, Medicine, Nursing & Health Sciences, Monash University
(<http://oecdsurvey.med.monash.edu.au/>)
- IT content assessed at W3C (<http://www.w3.org/>)



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Content validation online

Benefits

- Healthcare experts could log-on to a website and complete the survey instrument 24/7, regardless of location
- Allowed participant control of survey
- Efficient process
- Re-usable all over the world



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Content validation online cont'd

Challenges

- Preparing the survey for the internet took about 8 hours- vigilance needed!
- Cost for the university to host the survey (ethics simplified though)
- Power failure



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Content Validation Index

- Scored: 1 – Low to 4 – High
- Average Score: 3.37
- Lowest Score 2.63
- Only three questions mean with scores of less than 3.0
- Some question need rewordings



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Questions with score less than 3

- 2. People take every opportunity to improve the security of the information systems and networks.
- 13. People in the organization care about the legitimate interests of others.
- 18. Democratic values of justice and equality are taken into consideration by the organization when dealing with all issues relating to maintaining information systems and network security.



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Example of some comments

- Q.29- *Not sure that people would know what an 'expansive approach' is...*
- Q.18-*values of justice and equality'] ...too abstract for all to understand?*
- Q15- *Need to specify the aspects of the organisation being discussed, some process may be fair and others not. (Specificity)*



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More comments

- The term 'people' was queried in Questions 11, 13 and 2
- For instance: Q.11- *Who are 'people'-e.g. employees?*



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The Next Steps

- Assessment of web-based validation process and data collection
- Revise wording of the items based on review of the experts
- Assess the psychometric properties



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Thank you!

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