



# A Web-Based Group Decision Support System for the Selection and Evaluation of Educational Multimedia

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# Outline

- # Problem statement
- # Importance and complexity of EMM
- # Knowledge Management and EMM
- # Proposed Model
- # System Evaluation
- # Conclusion

# Problem Statement

- # EMM a great tool
  - ◆ to improve teaching and learning
- # EMM selection and evaluation
  - ◆ a complex task and interdisciplinary problem
  - ◆ characterised by
    - ✦ Uncertainty, dynamics, explicit and implicit knowledge and constraints, and
    - ✦ involvement of different stakeholders

# Problem Statement (cont.)

## # Objective

- ◆ A domain-based web oriented Group Decision Support System (GDSS)
- ◆ investigate the viability of developing and validating a web-based GDSS
  - ✦ integrated with KM and
  - ✦ instructional design - ID

# Importance and Complexity of EMM

- # Providing quality education and training
  - ◆ Students, stuffs
- # Internet + Multimedia
  - ◆ leads to the creation of content-rich and easy-to-access applications
    - ✦ self-paced learning
    - ✦ mobile learning (mLearning)
    - ✦ distance education
    - ✦ group-based tele-learning

# Importance and Complexity of EMM (cont.)

- # EMM - a packaged for
  - ◆ instructional material (content)
  - ◆ assessment tools, and
  - ◆ course management system
  
- # Selection and evaluation of EMM systems - a complex problem
  - ◆ many interrelated factors
    - ✦ diversity of required knowledge
      - Internet technology, educational evaluation, software engineering, and other areas
    - ✦ characteristics of the problem
    - ✦ competencies and interests of stakeholders

# Knowledge Management and EMM

- # Knowledge management (KM)
  - ◆ human resource
  - ◆ enterprise organization and culture,
  - ◆ IT, methods and tools to support and enable it
  
- # KM - six cyclic steps
  - ◆ Create
  - ◆ Capture
  - ◆ Refine
  - ◆ Store
  - ◆ Manage/update, and
  - ◆ Disseminate the knowledge

# Knowledge Management and EMM (cont.)

## # KM - basic process

- ◆ To increase/create knowledge
  - ✦ to discover, to research, to read, and to study knowledge.
- ◆ To capture knowledge
  - ✦ to write, and to record knowledge
- ◆ To refine knowledge
  - ✦ to verify, to correct, to update, to augment, to clarify, and to generalize knowledge.
- ◆ To share knowledge
  - ✦ to present, to publish, to distribute, and to discuss knowledge
- ◆ To apply knowledge
  - ✦ to plan, to decide, to design, to build, and to solve problems

# Knowledge Management and EMM (cont.)

- # Knowledge Management Systems (KMS)
  - ◆ A tool to supporting knowledge management

# Instructional Design (ID)

- # Outcome of the relationship of KM and EMM
- # Definition
  - ◆ a decision-making process of identifying the most effective instructional methods under given conditions to achieve optimal outcomes
- # ID - a systematic approach to instructional planning
  - ◆ a project team analysing a problem situation,
  - ◆ exploring alternative performance support or instructional solutions, and then
  - ◆ planning, implementing, evaluating, and managing solutions

# KM in Instructional Design

- # ID - a problem solving process
- # It is recommended to use a KMS to support ID
- # Example
  - ◆ the European Commission Fifth Framework Adapt IT Project involves the use of a KMS in the design and development phases of ID

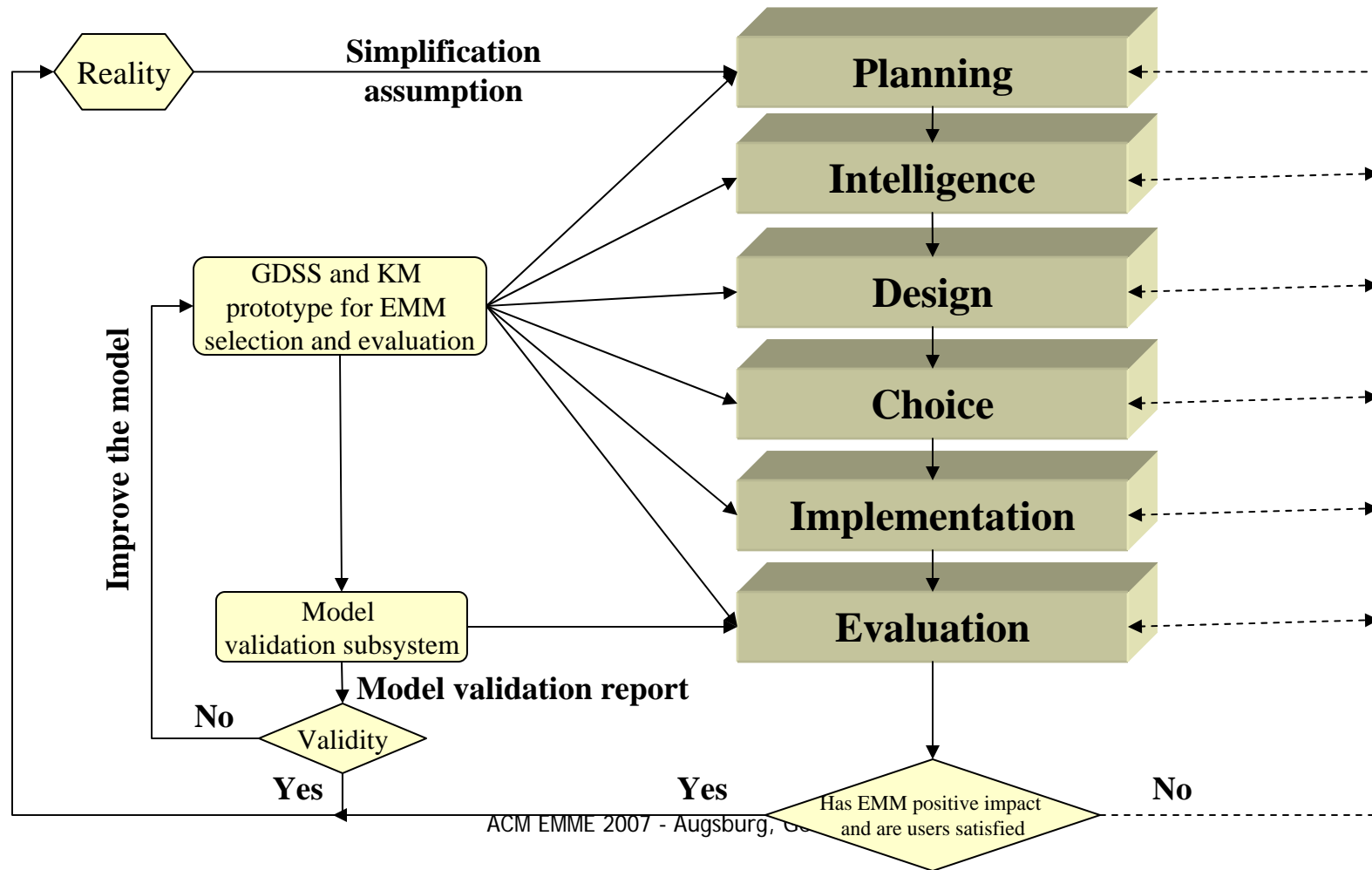
# KM in Higher Education

- # Two main shortcomings in existing systems
  - ◆ No comprehensive conceptual evaluation model to manage the process of selection and evaluation of EMM
  - ◆ the need for an online solution to make the process easy, accessible, systematic, flexible and interactive

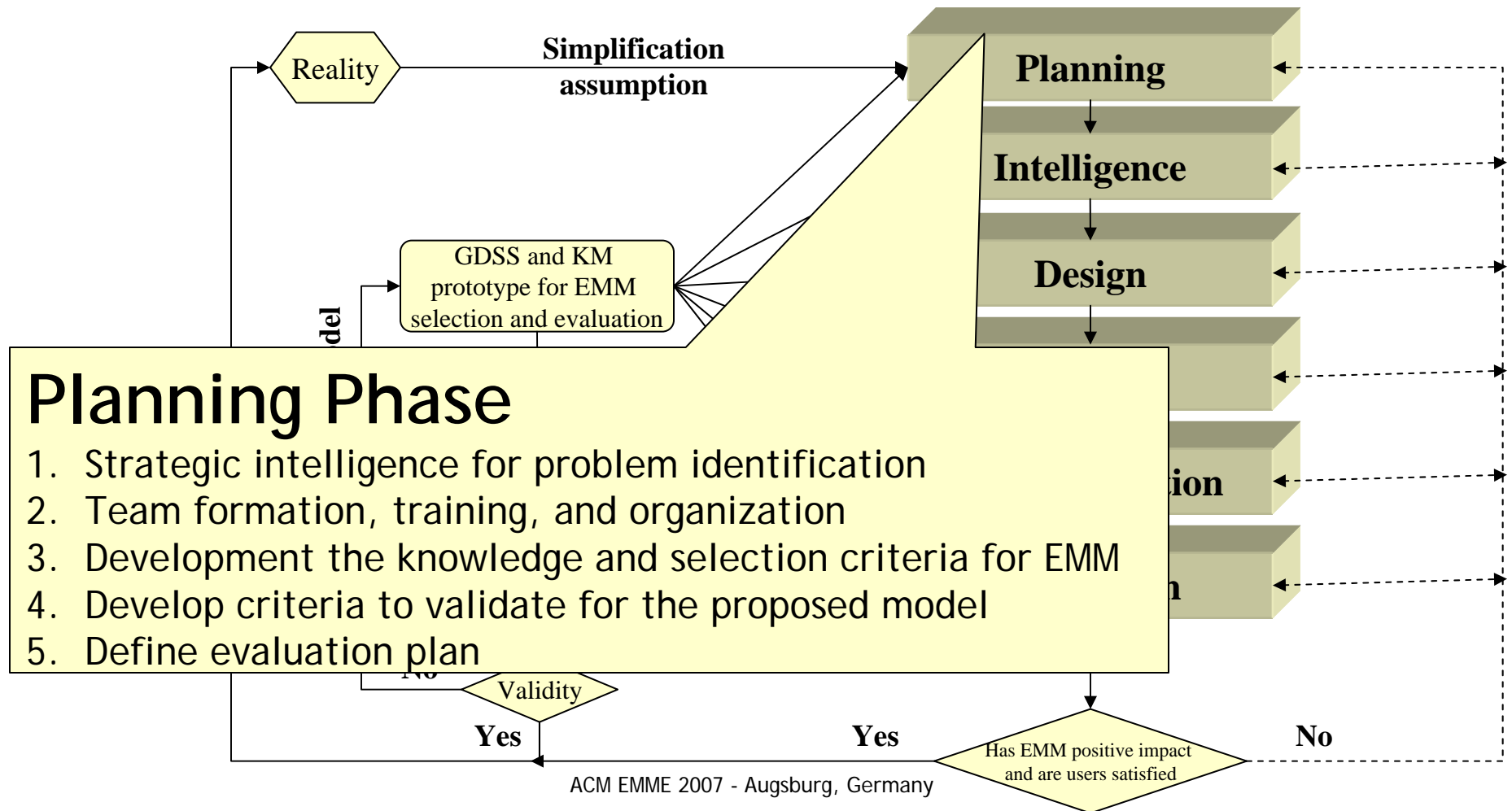
# Proposed EMM Model

- # A web based GDSS
- # The model aims to be
  - ◆ Systematic
  - ◆ Interactive
  - ◆ ready and easy to use
  - ◆ highly availability
  - ◆ support zero-administration clients
  - ◆ security and privacy
  - ◆ uses KM and Web based GDSS to support higher education at strategic, tactical, and operational levels

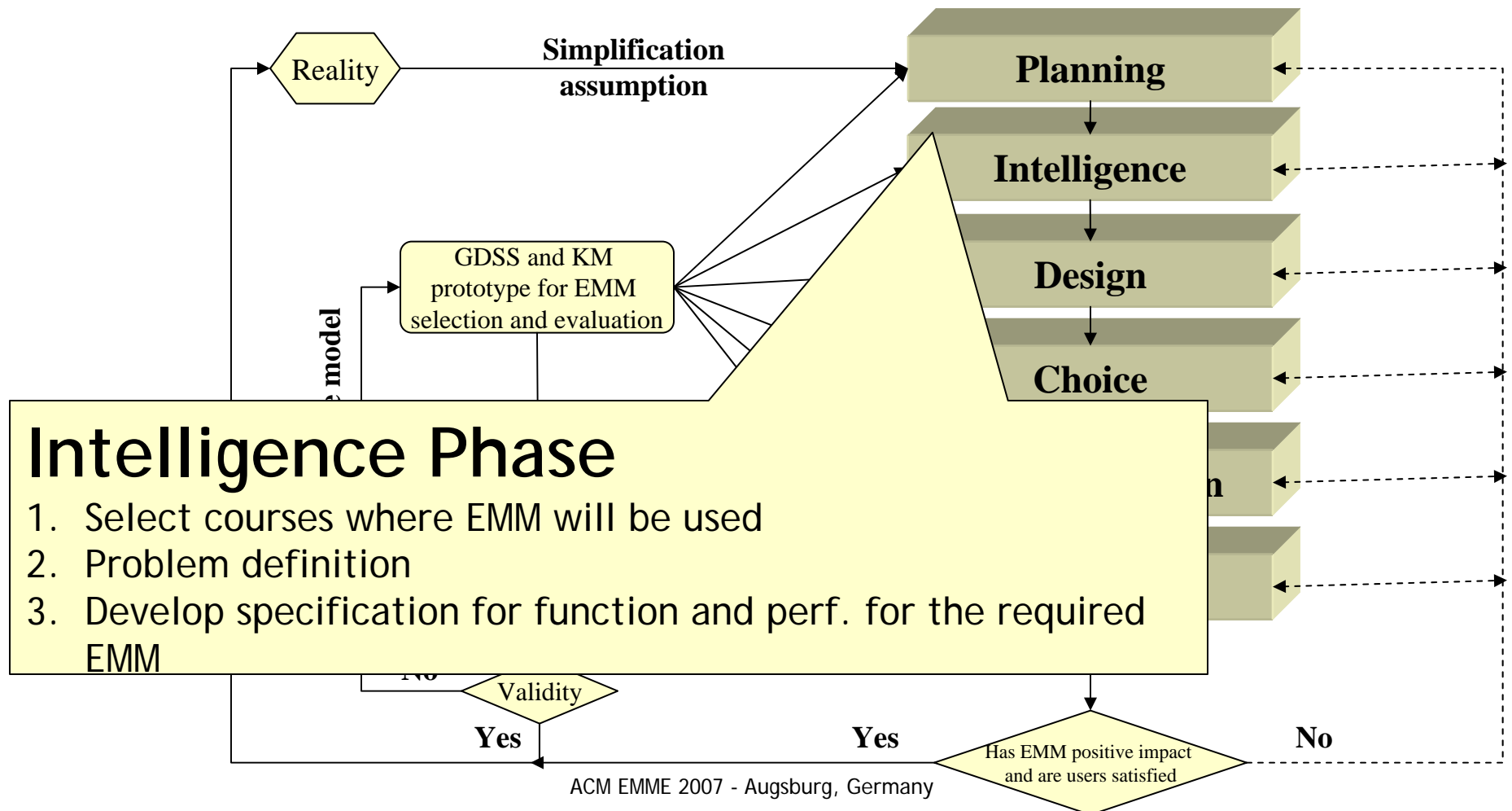
# Proposed EMM Model (cont.)



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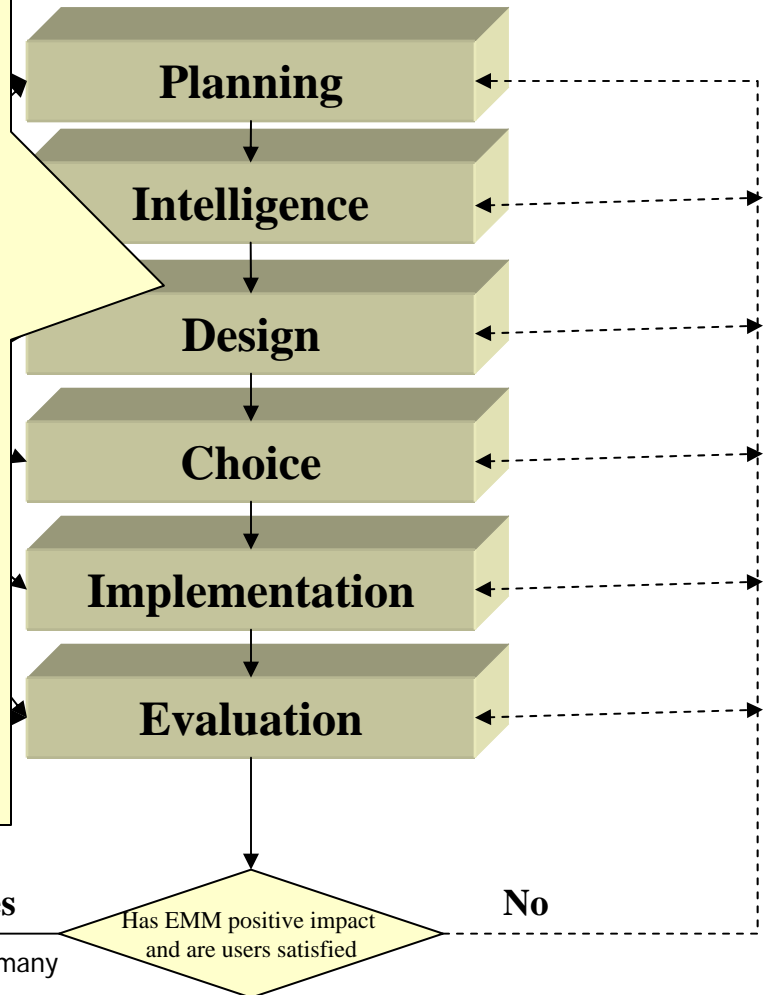
# Proposed EMM Model (cont.)



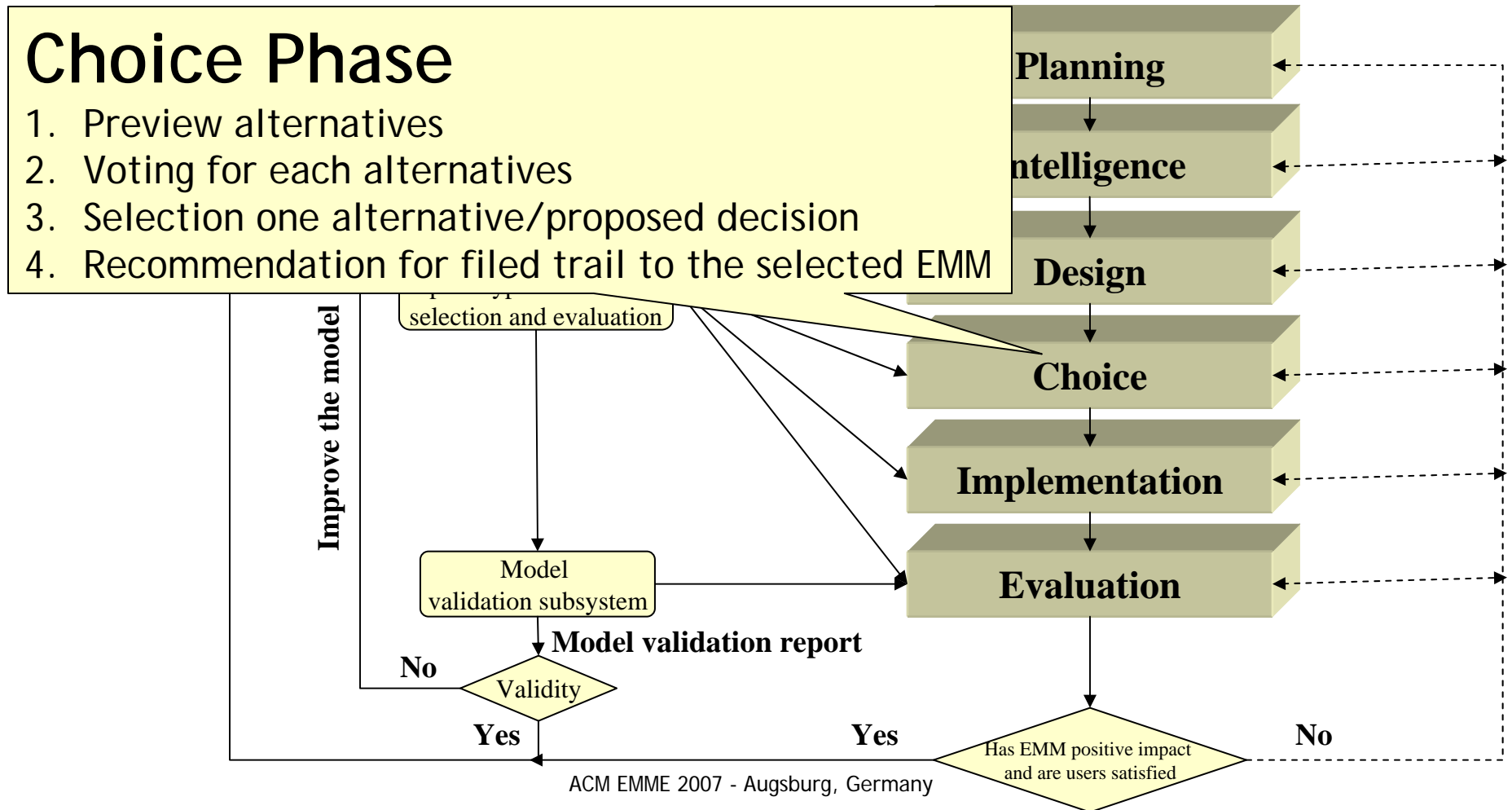
# Proposed EMM Model (cont.)

## Design Phase

1. Review published selection criteria in planning phase
2. Customized the selection and evaluation criteria
3. Develop instructors' satisfaction questionnaire
4. Develop students' satisfaction questionnaire
5. Gather information about alternatives
6. Conduct predictive evaluation for the alternatives
7. Identify promising alternatives
8. Design decision model



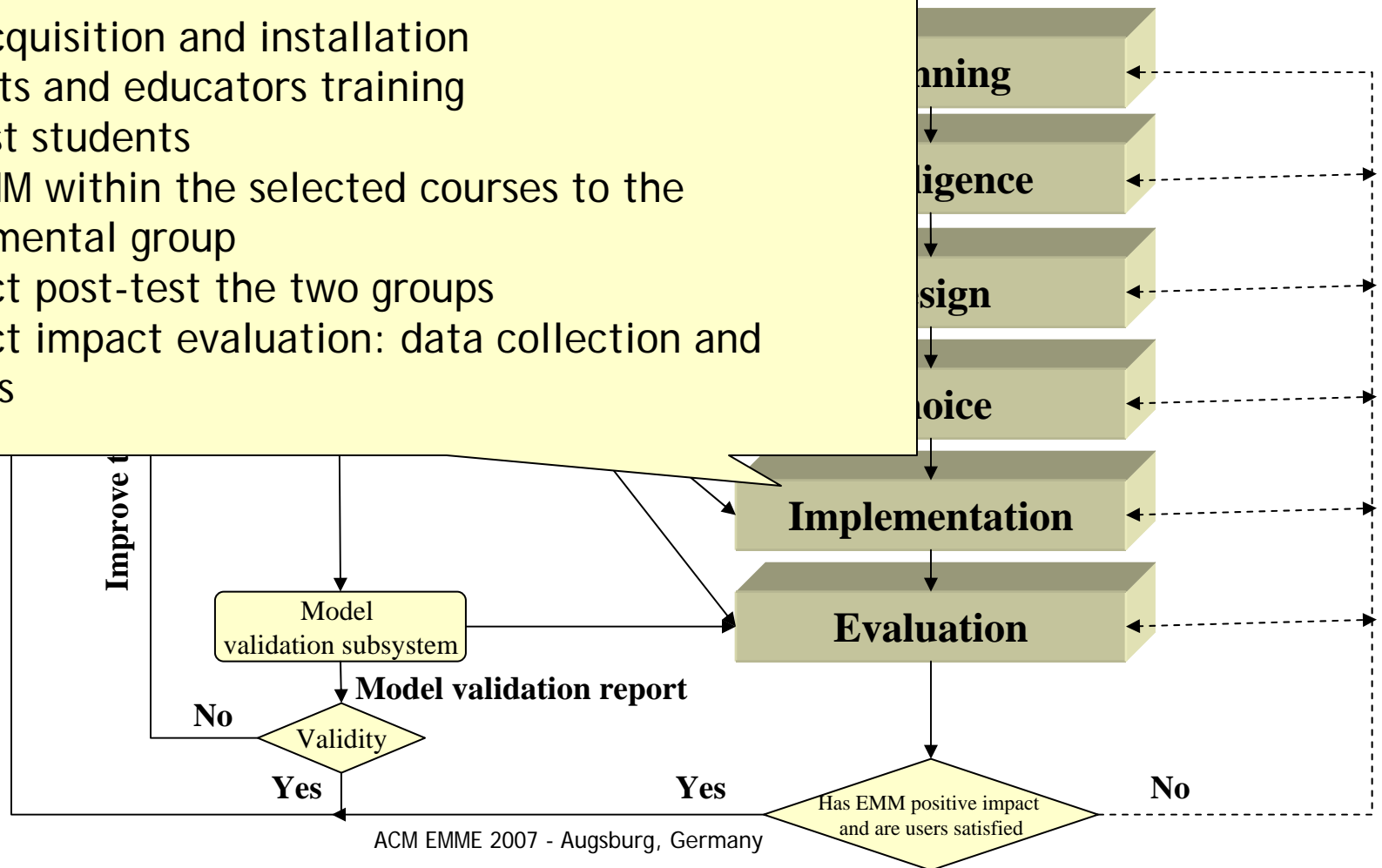
# Proposed EMM Model (cont.)



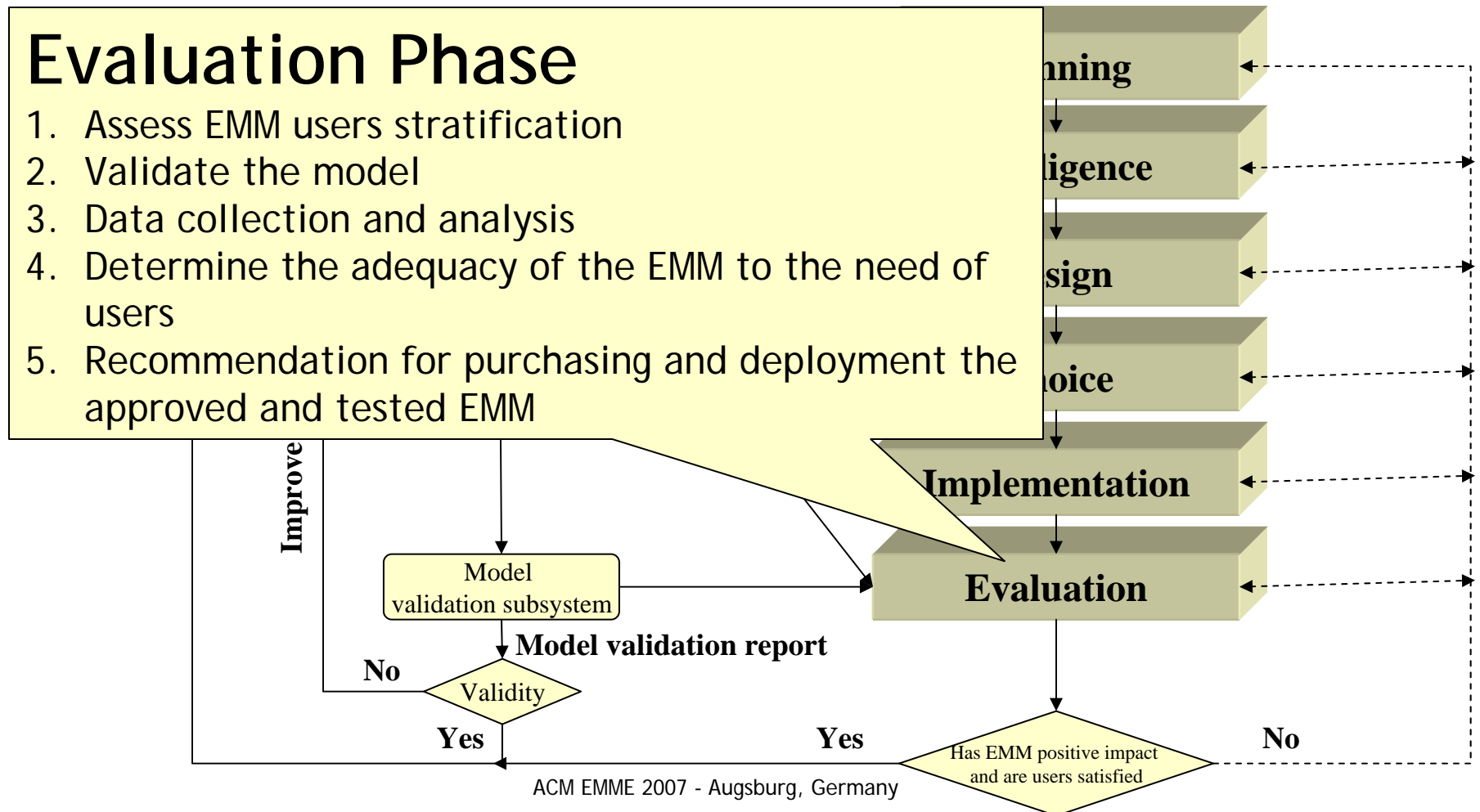
# Proposed EMM Model (cont.)

## Implementation Phase

1. EMM acquisition and installation
2. Students and educators training
3. Pre-test students
4. USE EMM within the selected courses to the experimental group
5. Conduct post-test the two groups
6. Conduct impact evaluation: data collection and analysis



# Proposed EMM Model (cont.)



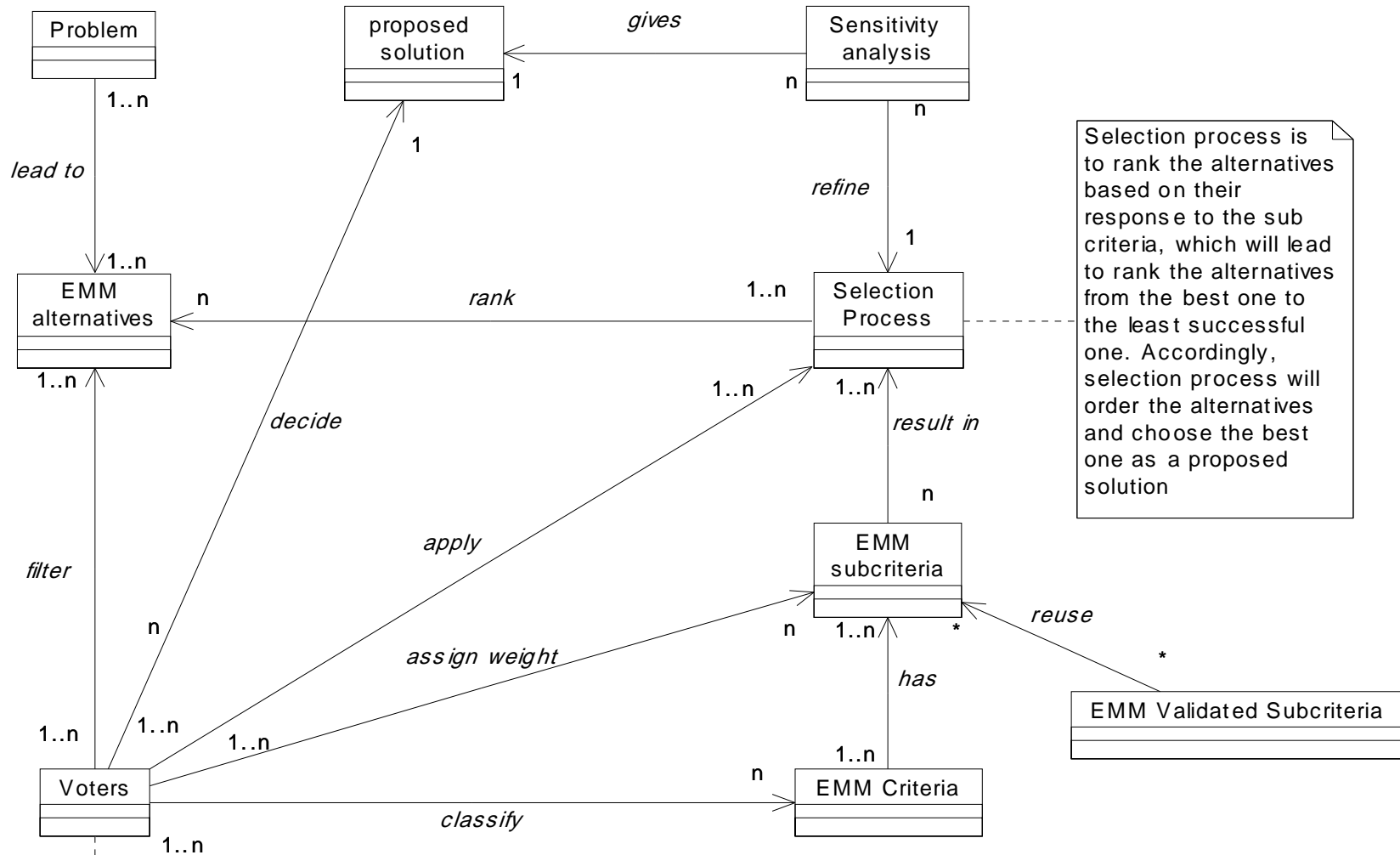
# Users' role and links with Phases

Phase	Process	External Expert	Internal Expert	Instructor	Student	Researcher/CKO
<b>Planning</b>	Define stakeholders					*
	User management					*
	Develop EMM selection criteria	*	*			*
	Develop Model Evaluation criteria	*	*	*		*
	Manage the knowledge					*
<b>Intelligence</b>	Define the problem		*	*		*
	Manage the problem					*
<b>Design</b>	Propose Alternatives		*	*		*
	Set Main criteria		*			*
	Develop/reuse sub criteria		*			*
	Vote to select promising EMM		*	*		*
	Construct the problem		*	*		*
	Publish the problem					

# Users' role and links with Phases

Phase	Process	External Expert	Internal Expert	Instructor	Student	Researcher/CKO
<b>Implementation</b>	Conduct pre test			*		
	Conduct post-test			*		
	Preview pre-post test and T test analysis		*	*		*
<b>Evaluation</b>	Student satisfaction questionnaire				*	
	Preview student satisfaction report		*	*	*	*
	Instructor satisfaction questionnaire			*		
	Preview instructors satisfaction report		*	*		*
	Validate the model	*	*	*		*
	Preview Model evaluation report	*	*	*		*
	Document lessons learned					*

# EMM Selection Process



Selection process is to rank the alternatives based on their response to the sub criteria, which will lead to rank the alternatives from the best one to the least successful one. Accordingly, selection process will order the alternatives and choose the best one as a proposed solution

Voters are Chief Knowledge Officer, Internal Expert, Instructor

# System Evaluation

## Problem Report

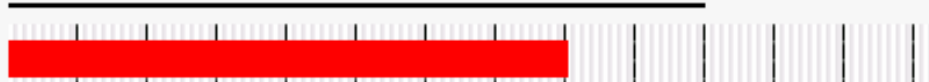


(according to weights assigned to main criteria)  
(change sensitivity analysis by [changing weights](#))

### Select & evaluate Photoshop Tutorial ([Simple](#) | [Detailed](#))

Assess the impact of using EMM as teaching and learning tool

Problem Votes					
Evaluation Factors (Groups)	EMM as application software 10%	EMM as Learning and/ Teaching media 40%	EMM as Management and Assesment tool 10%	EMM Content 40%	Total
+ Photoshop tutorial- Pc-lab	6.24%	31.04%	6.00%	37.33%	80.61%
+ Photoshop tutorial- Aris	5.13%	21.67%	4.00%	32.00%	62.79%
+ Photoshop tutorial- 3D	5.04%	22.72%	6.00%	29.33%	63.09%

Photoshop tutorial- Pc-lab	80.61%	
Photoshop tutorial- Aris	62.79%	
Photoshop tutorial- 3D	63.09%	

**Proposed Solution: 80.61%** Satisfaction according to assigned weighted criteria:  
**Photoshop tutorial- Pc-lab**

# System Evaluation

## Student Satisfaction Questionnaire Report

SA: Strongly Agree, A: Agree, SD: Strongly Disagree, DA: Disagree, SWA: SomeWhat Agree

25 Student(s) have answered the satisfaction questionnaire (54 questions) and the result is as follow...

	Questions	SA	A	SWA	DA	SD	Mean
1	Are computer hardware and software requirements for the software specified in the user guide?	11	8	3	3	0	4.08
2	Is it easy to operate/use?	14	6	4	1	0	4.32
3	Is the users technical guide/documentation intelligent ?	13	6	4	2	0	4.20
4	Does the online (if any) Users technical guide/documentation intelligent, sufficient, and effective ?	16	4	3	1	1	4.32
5	Is it easy to install ?	19	3	2	1	0	4.60
6	Does it run as intended on user's hardware and operating system?	20	2	2	1	0	4.64

# System Evaluation

## Model Evaluation Report

**Legend: SA: Strongly Agree, A: Agree, SWA: SomeWhat Agree, D: Disagree, SD: Stongly Disagree..**

**45 users have evaluated the model.....**

	Question	SA	A	SWA	D	SD	Mean
1	Does the site support evaluation processes as project management issues such as providing guidelines, determining process sequence, stakeholders identification, team formation, assigning roles, and coordination?	30	8	4	3	0	4.44
2	Does the site provide acceptable level of security to all participants?	31	9	3	2	0	4.53
3	Does the site support organizational learning concerning, EMM evaluation, group decision making, and technology integration in the context of higher education?	33	5	4	3	0	4.51
4	Does the site provide necessary sources of knowledge, using related links?	31	6	3	5	0	4.40

# Conclusion

- # The proposed web based GDSS
  - ◆ a successful supportive tool for the specified decision making processes required for selecting and evaluating EMM for higher education
  
- # Integrating a continuously-self-evaluating KM system into the higher education processes
  - ◆ quite useful and highly recommended
  
- # More interdisciplinary and empirical research required
  - ◆ to improve the design, implementation, evaluation