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# Writing and presenting Quality conference papers


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## Topics

- **Introduction**
- Different types of papers
- Co-authoring
- Sources of ideas and topics
- The abstract
- Annotated outlines
- Researching the subject
- Writing the paper
- Plagiarism and leveraging on other people's work
- IP issues
- Manuscript submission and the review process
- The conference presentation
- Summary and conclusion



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## Readings

- **0002** Kasser J.E., "A Proposed Paper Template for improving the Quality of Practitioner Written Papers at Conferences and Symposia", *Proceedings of the 16th International Symposium of the INCOSE*, Orlando, FL., 2006.
- **0003** Kasser J.E., Author Instructions for APSEC 2007 Presentations.
- **0004** Eichhorn, R., Developing thinking skills: critical thinking at the army management staff college, 2002.
- **0005** INCOSE 2008 - paper evaluation criteria
- **0006** Kasser J.E., "Raising the Quality of Conference Papers", *Quality in Postgraduate Research*, Adelaide, 2002.
- **0007** Kasser J.E., "Improving the Systems Engineering Documentation Production Process", *Proceedings of the NCOSE 5th International Symposium*, St. Louis, MO., 1995.


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## Purposes of publishing

- Subsidized trip to conference location
- Academic brownie points
  - Conferences don't count for much anymore
- Looks good on resume
  - Shows initiative, expertise, etc.
- Make a contribution to the discipline
  - Now you are talking
- Others

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## Mind the Gap!



- Supervisor
- Event
- Reading
- Idea
- Activities
- Experience
  - Work
  - Hobby
  - INCOSE SIG

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## Co-authoring



- **Advantages**
  - Different perspectives
  - Interdisciplinary possibilities
  - Emergent properties (synergy)
  - Credibility ?
  - Brownie points
- **Disadvantages**
  - Relationship
  - Grammar and style differences

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## Different types of papers

- Personal experience
- Case studies
- Research papers
- Practical advice
- Concepts and ideas
- Educational
- Literature review
- Others



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## Topics

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## Abstract example - 1

- **Abstract.** In teaching systems engineering the relationship between functions, physical decomposition and requirements during the process of defining, designing and developing the system, has been difficult to get across to the students. While trying to improve the learning process, an explanation of the relationship between functions, physical decomposition and requirements during the process of defining, designing and developing the system based on a modification of the Functions Requirements Answers and Test (FRAT) views of a system (Mar, 1994) was tried on undergraduate students at the University of South Australia in 2006-2007 with positive results (Kasser, et al., 2007). This paper uses the adapted FRAT as a frame in which to describe the relationship between functions, physical decomposition and requirements using as an example the definition, design and development of the control and electronics part of the LuZ solar electrical power generating system (SEGS-1) in 1981-1983 (Kasser, 1984). The paper also provides some lessons learned from the project.

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## Abstract example - 2

- **Abstract.** In teaching systems engineering the relationship between functions, physical decomposition and requirements during the process of defining, designing and developing the system, has been difficult to get across to the students. While trying to improve the learning process, an explanation of the relationship between functions, physical decomposition and requirements during the process of defining, designing and developing the system based on a modification of the Functions Requirements Answers and Test (FRAT) views of a system (Mar, 1994) was tried on undergraduate students at the University of South Australia in 2006-2007 with positive results (Kasser, et al., 2007). This paper uses the adapted FRAT as a frame in which to describe the relationship between functions, physical decomposition and requirements using as an example the definition, design and development of the control and electronics part of the LuZ solar electrical power generating system (SEGS-1) in 1981-1983 (Kasser, 1984). The paper also provides some lessons learned from the project.

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## Abstract example - 3

- This is a paper on thinking about thinking. Systems engineering is an emerging discipline in the area of defining and solving problems in the manner of (Wymore, 1993). The emerging paradigm for problem solving is "systems thinking". Both systems engineering and systems thinking have recognized the need to view a system from more than one perspective. This paper proposes a set of perspectives for applying systems thinking in systems engineering and then defines a systems thinking perspective set of views for a system, the use of which will provide one way of aligning systems thinking to systems engineering. The paper then provides an example of applying the set of perspectives to the Royal Air Force Battle of Britain Air Defence System and shows that not only does the set of perspectives provide a way to model the system; it also picked up two potentially fatal flaws in the system. The paper then concludes with some observations on the state of systems engineering from a number of the perspectives.

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## Creating the abstract

- A clear and concise message to interest the delegates into
  1. attending your presentation, and
  2. reading the whole paper
- Process for writing the abstract
  1. Dot points initially
  2. Text format when paper is almost finished

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## Example of an initial abstract

- Describes a journey of research into SE and the development of the course over several years
- Major challenges faced
  - Define SE or at least show why there is a disagreement
  - Develop a way to teach SE and be able to assess the ability of students applying systems thinking to problem solving.
  - Pedagogy – lecture-c to hands-on-c
- Shows syllabus
- Discuss convert format from lecture to practical
- Results in classroom
- SE in the Hall 1969 tradition, problem, research, integrate solution

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## Exercise – writing the abstract

- Write abstract
  - Dot points
  - Three parts



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## Topics

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- **Annotated outlines**
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## Writing the annotated outline

- Outline
  - Table of contents
  - Annotated
    - an outline provides details of the content of each section as well as the headings
    - Presentation or outline format
- The format and flow of the document should depend on the type of paper
  - Kasser J.E., "A Proposed Paper Template for improving the Quality of Practitioner Written Papers at Conferences and Symposia, 2006
  - Kasser J.E., Author Instructions for APSEC 2007 Presentations.

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## Annotated outline concept

- Use the presentation concept
- Paper section is a presentation slide or two
- Dot points are subsections of the paper
- Talk is the content of the paragraph
- Review slides until content is correct
- Write the paper using the presentation as the guide
- Edit the presentation for presentation at the conference

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## Researching the subject


- Why the research should be done
- Where to find relevant material
  - conferences, books, journals, web sites, etc.
- How to cite sources
- An awareness of intellectual property and plagiarism issues

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## Why the research should be done


- TRIZ
- Ensure the gap is real
- Locate similar, support, dispute
- Credibility
- Shows expertise in field
- Statement in submitted paper



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## Books, conference, journals and tools

- Google Desktop
- INCOSE i-Pub
- IEEE Explore
- CD ROMs
- University and corporate Libraries
- Amazon.com
- Internet search engines



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## Internet Search Engines

- <http://www.dogpile.com>
- <http://eric.ed.gov/>
- <http://www.incose.org/ProductsPubs/symposia/ipub.aspx>
- <http://www.amazon.com>
- <http://discover.theiet.org/>
- <http://books.google.com/>
- <http://scholar.google.co.uk/>
- <http://www.fedworld.gov/>
- <http://citeseer.ist.psu.edu/>

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## Incorporating references -1

- Much of the research into the three subject matter questions posed in Section 3.B (what is systems engineering, what do systems engineers do in the workplace, and what is a systems engineer?) had already taken place see (Kasser, 1996a; Kasser, 1997; Kasser and Massie, 2001; Kasser, 2002b; Kasser and Palmer, 2005; Kasser, 2007b; Kasser, 2007d).

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## Incorporating references-2

- Depending on their perspective, authors have written that the activities performed in producing the ancient pyramids, the canals and railways of the 19th century and other systems of the past are those embodied in systems engineering (Kasser, 1996a) or project management (George, 1972).

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## Incorporating references-3

- For example, the activities in the 1930's that led to the creation of the Air Defence System used by the Royal Air Force in the Battle of Britain have been called systems engineering with hindsight (Haskins, 2006).

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## Incorporating references-4

- There have been many discussions in the literature about the overlapping of, and differences in, the roles of systems engineering, operations research, systems architecting, and project management, e.g. (Brekka, et al., 1994; Roe, 1995; Kasser, 1996a; Sheard, 1996; Mooz and Forsberg, 1997; Friedman, 2006). (Mooz and Forsberg, 1997) **wrote that systems engineering and project management should be integrated. They state that .....**

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## Exercise - writing the annotated outline

- Create an annotated outline for your paper
- State type of paper
- Each section shall contain
  - The proposed content
  - Some references
  - Where the rest of the content will be researched
  - Demonstration of critical thinking
  - The proposed content of any figures and tables if they are to be used

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## Topics


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## Writing the paper -1


- Convert outline to paper
- Use appropriate style guide or template
- Use tool for managing references
- Use spelling and grammar checker
- Adhere to the page limit
- Do not plagiarise



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## Writing the paper -2

- Avoid jargon
- Spell out acronyms
- Text should flow logically
- Demonstrate critical thinking
- Stay focused on the topic
- Avoid clutter
- Use reviewers



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## Styles and Templates

As a consequence, demand for skilled, knowledgeable, Systems Engineers in government, industry, and academia is increasing around the world (Arnold, 2006). However, in general, systems engineering seems to be poorly practiced (Kasser, 2007a).

As a consequence, demand for skilled, knowledgeable, Systems Engineers in government, industry, and academia is increasing around the world [4]. However, in general, systems engineering seems to be poorly practiced [52].

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## Critical thinking\*

1. Is the question at issue well-stated? Is it clear and unbiased? Does the expression of the question do justice to the complexity of the matter at issue?
2. Does the writer cite relevant evidence, experiences, and/or information essential to the issue?
3. Does the writer clarify key concepts when necessary?
4. Does the writer show a sensitivity to what he or she is assuming or taking for granted?
5. Does the writer develop a definite line of reasoning, explaining well how he or she is arriving at his or her conclusion?
6. Is the writer's reasoning well supported?
7. Does the writer show a sensitivity to alternative points of view or lines of reasoning?
8. Does he or she consider and respond to objections framed from other points of view?
9. Does the writer show a sensitivity to the implications and consequences of the position he or she has taken?

(\* Eichhorn, 2002)

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## Plagiarism

- Using someone else's work as if it was your own.
- You will be found out sooner or later
- It is your reputation
- **You should incorporate someone else's work in your own BUT do it right**
  - Give credit where it is due
  - Request permission if appropriate

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## Examples-1

- Since *"effective systems engineering calls for careful coordination of process, people and tools. Such coordination cannot be learned from books"* (Hall, 1962 page v) these needs levelled requirements on the pedagogy to add something to the book learning.

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## Examples-2

- This was not surprising since **systems engineering demonstrates some of the attributes of an emerging discipline, namely lack of agreement on many of the fundamentals and lack of an underpinning theory (Kasser, 2007c).** So, to meet the  
....

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## Examples-3

- **Students could even fail to complete the post-class assignment and still pass the course (albeit with a minimum passing grade) (Kasser, et al., 2005).** The students were learning to **do systems engineering by numbers!**

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## Examples-4

- As (van Peppen and van der Ploeg, 2000) wrote *"typically, an educational program is carefully designed, giving attention to the individual elements of the curriculum, the learning environment, and their interdependencies. A curriculum design (a specific sequence of knowledge-base and skill-building courses) specifies the criteria for course design (a specific combination of learning objectives, course materials, teaching methods, and tests), as well as the staffing of teaching faculty, course scheduling, and teaching facilities."* **Thus** designing a curriculum is an example of systems engineering of both the product and the process hence the title of this paper.

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## Examples-5

- These perspectives have been called cognitive filters in the behavioural science literature, e.g. (Wu and Yoshikawa, 1998), and decision frames (Russo and Schoemaker, 1989) in the management literature. Whatever they are called, they are the internal filters through which people view the world. They include ...

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## Examples - paraphrasing

**Original text in Vélez and Sevillano, 2007**

In a digital hardware design course, students should work similarly to digital hardware engineers in a company.

**As incorporated in a paper**

The immersion course format was developed to allow the students to perform systems engineering in the classroom in a systems engineering environment. This concept is supported by (Vélez and Sevillano, 2007) who stated that students in a digital hardware design course should do the same type of work as digital hardware engineers perform in a company.

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## IP issues

- Don't use too much from a single source
- Don't use figures and drawings from other sources without attribution
  - Except clip art
  - Generally permissible in the presentation
- Do not post your content [which contains figures and drawings from other sources] on the Internet


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## Writing and submitting the manuscript

- Determine target publication's style, page limit, etc.
- If you haven't already, read some issues of the publications and cite at least one article
- Write a draft using style
- Do while it is not time to submit
  - Wait some time
  - Rewrite
  - Q: is it time to submit?
    - Yes, submit?
- If ideas occur, update the manuscript
- Decision
  - Give reviewer's comments all the consideration they deserve

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## Reviewers



- Reviewers set the quality of the conference
- Reviewer's comments may or may not be pertinent
- Generally no criteria for qualifications of reviewers
- Conference criteria for evaluation of papers
  - Examples follow

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## SETE 2002/3

When assessing the contribution, you are asked to confirm that:

- the paper represents a contribution to the theory or practice of systems engineering or test and evaluation;
- the title correctly conveys the content of the contribution,
- the paper has a coherent structure with an abstract, introductory material, main body, and conclusion;
- the figures are properly captioned and are of reproducible quality;
- the symbols and notations are those in general use;
- references are included at the end of the paper.

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## SETE 2004

1. The subject matter is **sufficiently related** to Systems Thinking, Systems Engineering, or Test and Evaluation (it need not be closely related to the conference theme)
2. The **draft paper indicated that the final paper will be acceptable for publication** in the conference proceedings
3. The title, abstract and keywords **accurately reflect the content** of the paper
4. **The objectives of the work are clearly stated**
5. **The results are well presented and interpreted**
6. **The conclusions are logical and clearly stated**
7. All **cited references are relevant** and listed in the correct format
8. The paper is free of commercial influences (i.e. not a marketing exercise)
9. The English in the paper is appropriate for publication

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## CSER 2006/7 evaluation criteria

2006

*Please click on the most appropriate box on each line.*

	Disagree	Neutral	Agree
1. The abstract scope is appropriate for systems engineering.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. The abstract scope is research-oriented.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. The abstract offers a scientific basis for its conclusions.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. The abstract is cogent.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2007

*Please click on the most appropriate box on each line.*

	Disagree	Neutral	Agree
1. The paper's scope is appropriate for SE.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The paper is appropriate for a research-oriented conference.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The paper satisfactorily explains what was done.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The paper satisfactorily explains why it was done.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The paper satisfactorily explains the basis for its conclusions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The paper is cogent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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## INCOSE APSEC 2007

- Score each issue on scale of 1 to 5
- Weight score as below

	Score	Weighting %
Fits theme		25
New information		15
Useful information		15
Expand "on the point"		5
Explains "why"		5
States basis for conclusions		10
Provisional acceptance		25
<b>Total</b>		<b>100</b>

45

## INCOSE Evaluation Criteria for papers

1. Content **advances the knowledgebase for, or the practice of, systems engineering**
2. Content is **substantive**
3. Content is **logical**
4. Content **assertions are backed by supporting data**
5. Content is **effectively conveyed and key concepts are integrated**

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## My reviewer's comments on IS 2007 submissions

The author writes **"Goal of Integration. The goal of integration is find unforeseen problems as early as possible, in order to solve these problems in time."**

**My comment**

**If this is true, then a successful integration is one that finds unforeseen problems.** If the system components integrate without any problems, then by the author's definition, the integration was unsuccessful.

The purpose of the

- integration **test** is to find problems.
- integration **process** is to integrate the subsystems into an operational system.
- System acceptance test is to verify compliance to system requirements.

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## Ambiguity

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## What was wrong, why?

The author writes "The traditional approach to developing command and control systems is inadequate **because** it typically views systems in a stovepipe fashion with minimal interactions with other systems". **Please cite references.**

On page 9, the author writes "**Many texts** highlight requirements as the first step in the systems engineering life cycle". **Cite some please.**

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## Comments ?

The paper provides a useful review of published concepts. However, it is written as a speech, not as a paper. Moreover, the paper does not acknowledge any prior work in the area; since there are no references to the volumes of work that have already covered most if not all of the concepts.

This is a classroom lecture on relationships between object-oriented properties of requirements. While there is some useful information, it is written in the form of the author pushing his product, with no references to previous similar work.

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## Comment on IS 2008 submission

In his reason why paper enhances SE, the author states **he has not found references to innovation in INCOSE.** However, a quick pdf search for the word "innovation" on the symposium proceedings from 1993 to 2006 **found more than 500 documents and 1893 instances in those documents.** The word "innovation" was also contained in **more than 20 papers on the 2007 symposium CD alone.**

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## Another one

**Authors of the paper write that reliability is ignored by INCOSE**

However, a quick pdf search for the word "reliability" on the symposium proceedings from 1993 to 2006 found more than 500 documents and 1969 instances in those documents. **I suggest the authors rephrase that statement.**

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## Taking the ego out

- Take care to prevent negative comments
- Develop a thick skin
- Pay attention to comments
- Remember there are no qualifications for reviewers
- Resubmit elsewhere

• Kasser J.E., "Raising the Quality of Conference Papers", *Quality in Postgraduate Research*, Adelaide, 2002.

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## INCOSE Symposium Reviews I have received

### (49) CREAP: The Case Study

- After reading the paper, **I still do not know what CREAP is supposed to do.** The **description** of the element of CREAP is **poor and not comprehensible.** **This effort is too ambitious (in my opinion) for 20 weeks, even for mature grad students.**
- This paper is much more about a software project and its good and bad points, **not much ties to SE.**
- Good case study of the SE process, however the paper is hard to follow,** as the author has several tense changes. It would read more effectively if the grammar were cleaned up.

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## (54) "Synergizing Workplace Research and Postgraduate Degrees"

- **Paper has limited value to Systems Engineering.**
  - but is a good argument for optimizing the knowledge base. I liked the idea of using industry or professional organization based research resulting in advanced degrees for the practitioners.
- **Makings of a landmark paper.**
  - This is not a professional paper but a proposal. The concept is not based on data but on opinion. The author should pursue his recommendations.

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## (50) "Does Object-Oriented System Engineering Eliminate the Need for Requirements?"

- This paper addresses a point of view that I have not encountered that 'requirements' can be eliminated. As such, **it addresses a 'new' issue which should be discussed.**
- **Good relevant topic and good content.**
- **This is a** distressingly software-centric view of systems engineering **possibly written by someone with no practical experience in Systems Engineering.**

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## Grounds for rejection

- Should be based on
  - Incorrect facts
  - Failure to do homework
  - Does not fit conference/symposium theme
  - Does not make contribution
  - Lack of critical thinking
- Should not be based on
  - Difference of opinion between author and reviewer

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## Exercise - Paper review

- Review your work
- Modify based on
  - Critical thinking reading
  - Typical Reviewer's comments
- Prepare <= 10 min NEW presentation on
  - Changes to the paper
    - **The types of changes** you made
    - **Why you made the changes**

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## Topics

- Introduction
- Different types of papers
- Co-authoring
- Sources of Ideas and topics
- The abstract
- Annotated outlines
- Researching the subject
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- Plagiarism and leveraging on other people's work
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- **The conference presentation**
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## Preparing the presentation

- Presentation is the advertisement for the paper
- Presentation must excite the audience to read your paper and make use of the content
  - You have 2-3 slides (minutes) to catch their attention
- **Organise presentation about a key idea**
- Use examples

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## Preparing the presentation

- Presentation must hold their interest
  - Something they can
    - relate to
    - think about
    - expect

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## Effective presentations

- Objective
- Provide expected information
  - essential
  - important
  - supporting
  - irrelevant
- Rehearsed
- To the point



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## Effective presentations (cont.)

- Slides conform to Miller's rule
  - (Miller 1956)
- Presenter who expands on each slide
- Slides that have **bean** spelling checked
- Periodic progress slides
- Concluding slide
- Metric to determine degree of success of the presentation

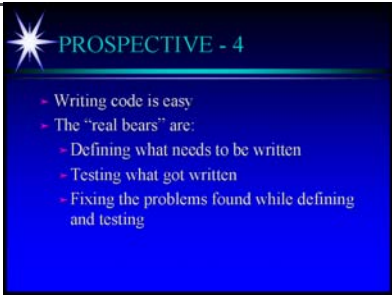
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## Effective graphics

- Simple
- Readable
  - font and contrast
- Clear and unambiguous
- Appropriate to the presentation
- To the point
- Consistent
- Support verbal information

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## Contrast ?



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## What point do you want to make?

SE Categories	ANSI/ISA-57	IEEE 1528	ISO 15926	EN 50126	EN 50128
Requirements management	System Design Requirements definition	System Design Requirements analysis Requirements validation Requirements management	System Design Requirements analysis Requirements validation Requirements management	System Design Requirements analysis Requirements validation Requirements management	System Design Requirements analysis Requirements validation Requirements management
System architecture	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition
System implementation	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition
Technical analysis	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition
Technical management/leadership	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition
System management	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition
Verification & validation	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition	System Design System Definition
In the standard, but not an agreement with other standards					

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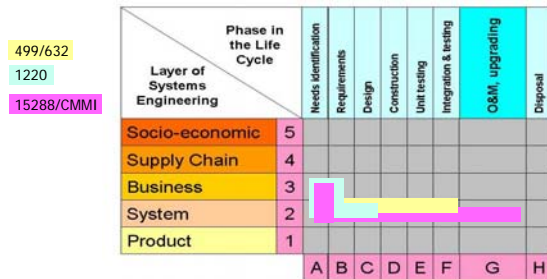
## This one: Focus of Standards\*

SE Categories	ANSI/ EIA 632	IEEE- 1220	ISO- 15288	CMMI	MIL-STD- 499C
Mission/purpose definition	No	✓	✓	✓	No
Requirements engineering	✓	✓	✓	✓	✓
System architecting	✓	✓	✓	✓	No
System implementation	✓	No	✓	✓	✓
Technical analysis	✓	✓	✓	✓	✓
Technical management/ leadership	✓	✓	✓	✓	✓
Verification & validation	✓	✓	✓	✓	✓

\* Honour E.C., Valerdi R., "Advancing an Ontology for Systems Engineering to Allow Consistent Measurement", CSER 2006  
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## So .. Standards in the HKMF?



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## Prepare back up slides

- Hyperlinks from final slide
- Anticipated technical questions
- VIP hot buttons
  - Supporting data
  - Charts
  - Pictures



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Example of final slide

## Questions? - discussion

### A Framework for Understanding Systems Engineering



Dr Joseph E. Kasser CEng, CM

- What's a Wicked Problem?
- Please repeat those Streams of Systems Thinking?
- What are the six questions to ask?
- What is the generic answer to all questions?
- Where did you get the clip art?

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## Rehearsing the presentation

- Time the presentation
- Rehearse in front of video camera
- Rehearse in front of peers
- Use feedback to update presentation
- Update presentation during symposium/conference if you can
- Final rehearsal the night before
- Find the room beforehand

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## Making the presentation - 1

- Keep to time
- Keep to time
- Keep to time
- Keep to time
- Keep to time
- Keep to time
- Keep to time
- Keep to time

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## Making the presentation - 2

- Be enthusiastic
- Expect people to leave
  - Don't comment, keep going
  - If they all leave, stop talking
- Use of notes
- Eye contact with audience
- Summarize the main concept



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## After the presentation

- No questions
  - Nobody was interested
  - You did a good job
  - You overwhelmed the audience with ....
- Questions
  - Clarification of something you said
  - Request for additional information
  - Questioner wishes to make their point
- Dealing with requests for copies of your presentation graphics

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## Postscript

- Watch other presentations
  - Good and bad/poor
  - Adopt the good
  - Make sure you are not as bad
- When you read papers
  - Good and bad/poor
- Let authors know what you think
- **Don't ever make anyone lose face!**



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## Useful texts

- Allen, M., *Smart thinking: skills for critical understanding and writing*, Oxford University Press, 2004.
- Wolcott, S. K. and Gray, C. J., "Assessing and Developing Critical Thinking Skills", *proceedings of Assessment Institute, Indianapolis, 2003*, [http://www.wolcottlynch.com/Downloadable\\_Files/IUPUI%20Handout\\_031029.pdf](http://www.wolcottlynch.com/Downloadable_Files/IUPUI%20Handout_031029.pdf), last accessed April 24, 2008.

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## Adieu

- Summary
- Questions
- Comments



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