MANU1381 Sustainable Engineering Systems and Environment

Assignment 1: Systems concepts and methodologies

Assessment Type: Individual or Group Report

Report length specifications:
1500 words per student
(+/– 10%)

Due date:

Report submission in Week 6

Weighting: 50%

Overview

This task evaluates your, or your team's ability to understand the systems approach in engineering management. You will need to select, investigate and then present the system structure, analyse the system, identify the roles of stakeholders and their expectations, and examine the relation among the subsystems. You will then need to identify a systemic problem or challenge and find an appropriate solution for it.

Group of *N* students' submission will be in the form of a Report in the length of *N*1500* words, i.e. a single student will submit *1500* words, two students *3000* words and three students *4500* words, which means that comprehensive study and reporting is needed.

Learning Outcomes

This assessment is relevant to the following learning outcomes:

- apply a systems approach to problem definition and solution of an industrial, or other business systems

Specifically, this assessment will determine your ability to:

- characterise the system under study
- describe the relationships between the different subsystems belonging to the system and examine the system's environment, complexity and dynamics
- determine the objective/purpose of the system under study and how the subsystems support this objective
- determine the appropriateness of the systems methodology in addressing the problem or challenge
- identify all the players that are affected by this problem
- choose an appropriate systems methodology and apply it to the problem or challenge
- examine each stage needed to carry out the analysis using the appropriate systems methodology (or methodologies)
- examine the practical problems likely to be encountered in implementing the methodology (or methodologies) together with suggestions for overcoming them

Assessment details

Task 1: Systems concepts

Select any engineering or technological business system. Good choices include large automotive manufacturers, aircraft manufacturers or industrial machine manufacturers. The best choice would be a company where you were or are currently employed. Alternatively, you can select any system for which you are able to gather sufficient relevant information to carry out the following tasks.

a) Characterise the system and specify system objectives. Describe the system in terms of the systems concepts. To put this system into context, consider the area you are working in as part of a subsystem or element.
b) Examine the system under study in terms of its environment, complexity and system dynamics.
c) Describe and examine the relationships between the sub-systems and the system as a whole.
d) Evaluate the role of various stakeholders and stockholders' expectations and the measurable requirements.
e) Explore how any future actions, or changes to any of the subsystems/elements, will affect the system as a whole.

Task 2: Systems methodology

Based on the system described in Task 1:

a) Identify the problems in the system under study and define the problems from a systems perspective.
b) For each problem identify and discuss if the problem is structured or unstructured.
c) Discuss which system approach (hard or soft) would be better suited for solving the specific problems.
d) Apply the chosen methodology to the problems and discuss its potential issues and limitations.

Suggested report structure

The following structure provides a guideline for the structure of the report and what you need to include in it. This forms the foundation for assessing your report's completeness and quality. Refer to the rubric for more detail.

Introduction
- Background information
- System selection

Characterisation of system under study
- Systems objectives/purpose
- Environment
- Subsystems objectives/purpose
- Elements of the subsystems and their attributes
- System relationships
  - System: Between each of its subsystems
  - Subsystems: Between each of the subsystems' elements
- System complexity
- Dynamics of system
- Stakeholders/players

Problem/challenge identification
- Problem/challenge description
- Problem context

Selection of system methodology
- Hard versus soft systems approaches

Application of system methodology

Brief description of the systems methodology
Examination of each stage in the context of the problem/challenge
Implementation issues

Conclusion

References

Referencing guidelines

You must acknowledge all the sources of information you have used in your assessments.

Refer to the RMIT Easy Cite referencing tool to see examples and tips on how to reference in the appropriated style. You can also refer to the library for more tools such as EndNote, http://rmit.libguides.com/endnote referencing tutorials and referencing guides for printing.

Use *RMIT Harvard referencing style for this assessment*.

Submission format

Upload as one single file via the *assignments'* submission page within Canvas.

Academic integrity and plagiarism

Academic integrity is about honest presentation of your academic work. It means acknowledging the work of others while developing your own insights, knowledge and ideas.

You should take extreme care to make sure that you have:

- Acknowledged words, data, diagrams, models, frameworks and/or ideas of others you have quoted (i.e. directly copied), summarised, paraphrased, discussed or mentioned in your assessment through the appropriate referencing methods,
- Provided a reference list of the publication details so your reader can locate the source if necessary. This includes material taken from Internet sites.

If you do not acknowledge the sources of your material, you may be accused of plagiarism because you have passed off the work and ideas of another person without appropriate referencing, as if they were your own.

RMIT University treats plagiarism as a very serious offence constituting misconduct.

Plagiarism covers a variety of inappropriate behaviours, including:

- Failure to properly document a source
- Copyright material from the internet or databases
- Collusion between students

For further information on our policies and procedures, please refer to the University website.

Assessment declaration

When you submit work electronically, you agree to the assessment declaration.

Working as a group

Many courses require you to work in a group to complete various assessments. It is the collective responsibility of all group members to actively contribute and complete any project. If any individual is unavailable during this time, the group will need to adjust responsibilities to allow for the work to be completed. It is recommended that students elect a group leader to take responsibility for this.

Working in a group requires consistent interaction and communication. This should be done within Canvas, Google Hangouts, email etc.

Should any individual be unavailable for an extended period of time, it is the responsibility of the group members, or group leader, to advise their tutor to discuss the situation. This should be raised as early as possible if students wish to apply for an extension, or special consideration.

Only one copy of a group assessment needs to be submitted, however all group names must be added to the report submission.

Assessment Criteria

Criteria	Ratings					Pts
Systems context	The context of the system is clearly, logically and comprehensively described. The purpose of the system is clearly described and critically analysed.	The context and purpose of the system are clearly described. The purpose of the system is described; however, it's not critically analysed.	The context and purpose of the system are clearly described. The purpose of the system is not clear and needs additional explanation.	The context and the purpose of the system are described; however, the description is not easy to follow or is given in non-logical way.	The context and purpose of the system are poorly described. The description is not logical or realistic.	
	10.00	7.90	6.90	5.90	4.90	10.0

Identification of the subsystems their relationships and complexity	The subsystems are correctly described as are all relationships between them and their given hierarchies. The description is logical and accurate. The importance of the relationships is discussed in detail. Stakeholders' expectations and measurable requirements have been critically discussed.	The subsystems are correctly described with all analysis of the relationships between them. Stakeholders' expectations and measurable requirements have been discussed.	Only some of the subsystems are described with stated relationships between them. The relationships are not discussed. Stakeholders' expectations and measurable requirements have been partially discussed.	The list of subsystems is incomplete and inconsistent. Stakeholders' expectations and measurable requirements have been partially discussed.	The subsystems have not identified clearly. Stakeholders' expectations and measurable requirements have not been discussed.	
	30.00	23.70	20.70	17.70	14.70	30.0
Identification and analysis of the problem in the context of system complexity and dynamics	More than one problem related to the system has been described and analysed in depth. The analysis is critical and covers all details.	More than one problem related to the system has been described and analysed. However, the analysis covers only the main features.	Only one problem related to the system has been described. However, the following analysis is very basic.	One problem related to the system has been described, but has not been analysed.	No problem has been described nor analysed.	
	25.00	19.75	17.25	14.75	12.25	25.0

Choice and implementation of systems methodology	The choice of soft/hard approach is realistic and the applications are described in detail. The limitations are discussed in detail. Decision-making process is logical and realistic.	The choice of soft/hard approach is realistic and the applications are described in detail. The limitations are discussed only in general terms. Decision-making process is described at the basic level.	The choice of soft/hard approach is realistic and the applications are described. The description is basic and it is not covering all problems. The limitations are discussed. Decision-making process is only mentioned but not discussed.	The choice of soft/hard approach is described; however, the proposed approach is not the best one. The limitations are not discussed. Decision-making process is not discussed.	The choice of soft/hard approach is not appropriate for the system. Limitations are not discussed.	
	20.00	15.80	13.80	11.80	9.80	20.0
Referencing	There is proper and consistent referencing with no errors.	There is mostly proper referencing with few errors.	Everything is referenced, but only correctly about two-thirds of the time	Everything is referenced, but only correctly about half of the time.	Statements, figures or tables from different sources have not been referenced.	
	5.00	3.95	3.45	2.95	2.45	5.0
Academic writing	Writing communicates meaning clearly and achieves purpose of the task with sound grammar and spelling.	Writing communicates effectively but logic and meaning are not always clear. Sound grammar and spelling.	Writing mostly communicates effectively, with occasional grammatical errors.	Writing lacks clarity with frequent grammatical errors, but the message still gets through.	Writing is very unclear and hard to make sense of. Several grammatical errors.	
	10.00	7.90	6.90	5.90	4.90	10.0
					Total:	100 pts

Please Note:
Total points for this Assignment contribute 50% to the Final Mark in the course.