

## The Implementation of Quality Management System (QMS) in Teaching, Learning and Assessment in Faculty of Engineering, Universiti Malaysia Sarawak

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### Abstract

The Quality Manual is developed for Faculty of Engineering's Quality Management System in Teaching-Learning & Assessment. In this Quality Manual, the Faculty of Engineering introduced the teaching, learning and assessment checklist that direct and control the faculty in order to continually improve the effectiveness of its performance. The main purpose of Quality Manual is to communicate to employees especially the academic staff on the faculty's quality policy and quality objectives, to facilitate the implementation of Quality Management System and its continuity and required updates, to provide effective communication, control of quality related activities and documents, to inform Faculty of Engineering stakeholders on the Faculty of Engineering's Quality Policy and Quality Objectives and to comply with MS ISO 9001:2008.

**Keywords:** QMS, Quality Manual, stakeholders, teaching-learning & assessment checklist.

### 1. Introduction

Quality Management System (QMS) can be defined as a set of coordinated activities to direct and control an organization in order to continually improve the effectiveness and efficiency of its performance. This QMS is developed based on quality principles such as leadership, customer focus, continually improvement involvement of the employees and stakeholders, process focus and ultimately decisions that are based on survey data, meetings or discussions among the employees and stakeholders. The benefit of introducing QMS is to ensure the student's and faculty's requirements are met. Besides, the QMS develop the quality working environment among faculty staff including academic, technician and supporting staff. This type of working environment shows that the quality is not only involve at the output side, but also including the input and working process part. The output involves the service and graduation of the faculty. Then, the examples of input are faculty staff, facilities and technology. The working process can be a manual. The QMS apply Total Quality Management (TQM) concept where the quality is a priority, besides the quantity [1].

### 2. Quality Manual

In order to implement QMS, the Faculty of Engineering, Universiti Malaysia Sarawak (UNIMAS) come up with Quality Manual as a quality guideline for faculty staff. This manual consist of eight (8) parts that are Scope of the manual, normative references, terms and definitions, quality management system, management responsibility, resource management, product realization and measurement, analysis and improvement. The important part of Quality Manual are part 4 until part 8 where these parts mention on the QMS, the application and also the monitoring, analysis and improvement. The relation of these 4 parts of Quality Manual is as Fig. 1.

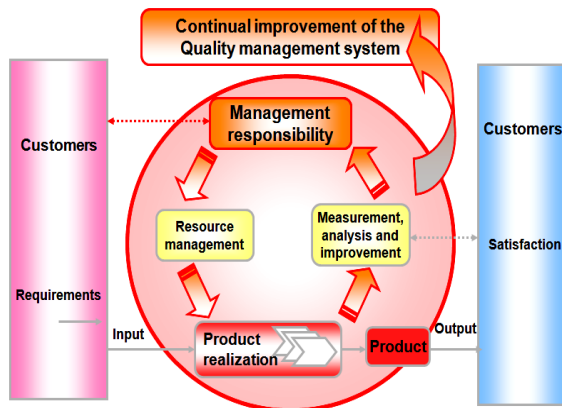


Fig. 1: Quality Management System [2].

Fig. 1 clearly shows that the QMS is a continually quality process. The model of the process-based QMS in Fig. 1 illustrates the process linkages of part 4 until part 8. It shows that customers play a significant role in defining requirement as inputs. Monitoring of customer satisfaction requires the evaluation of information relating to customer perceptions to whether the organization/faculty has met the customer requirements.

The Quality Manual develops based on MS ISO 9001:2008 standard. The Quality Manual that develops by Faculty of Engineering is emphasized on teaching, learning and assessment. It is develops in order to create the quality teaching, learning and assessment besides to disseminate the quality information to faculty staff members.

In part 1, it consists of the general requirement and the application scope of Quality Manual. Then, part 2 and part 3 is for normative references and terms and definitions, respectively. Part 4 that is QMS part consists of general requirement that faculty needs to come up in order to establishes, documents, implements and maintains the QMS and continually improves its effectiveness in line with the requirements of MS ISO 9001:2008.

For example, the faculty needs to determine teaching, learning and assessment activities which affect Faculty of Engineering QMS, ensure the availability of human and material resources, as well as necessary information to support teaching, learning and assessment activities, monitor and measure where applicable and analyze the achievement of planned results and perform continual quality improvement of teaching, learning and assessment activities.

In part 4, it consists also the documentation requirements. Example is as Fig. 2.

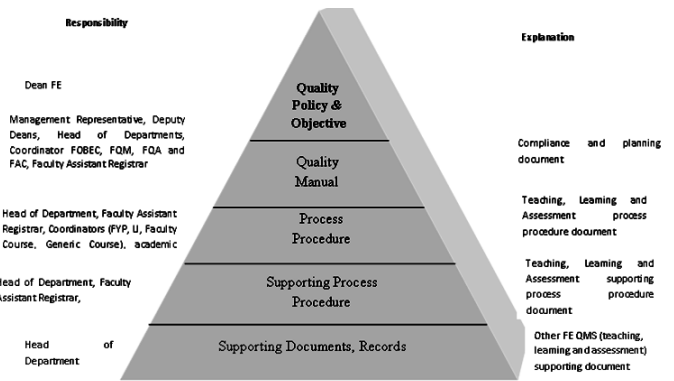


Fig. 2: QMS Structure.

After that, in part 5, management responsibility consists of the statement of faculty's quality policy, faculty's quality objectives, QMS planning, responsibility, authority and communication. Part 6 involve the management of resources including, human resources, facilities, infrastructure and working environment.

Part 7 and part 8 consist of the realization of the product and the process of monitoring, analysis and improvement, respectively.

The Quality Manual is support by the teaching, learning and assessment procedures document or known as teaching, learning and assessment procedure manual. It is divides into 2 main parts that are teaching, learning and assessment procedure and supporting procedure such as document control, record control, internal audit and maintenance.

There are 12 procedures for teaching, learning and assessment procedures; teaching appointment letter, teaching-learning with lecture & tutorial approach, teaching-learning with cooperative learning approach, teaching-learning with site/industrial visit approach, teaching-learning with project approach, teaching-learning with laboratory approach, teaching-learning based on problem based learning (PBL), teaching-learning based on final year project (FYP), teaching-learning based on industrial training (LI), teaching-learning based on integrated design project (IDP), teaching-learning with lecture, invited lecture/speaker and customer feedback. Forms that required are also included in the procedure. For example, report presentation rubric form and oral presentation rubric form.

Beside the teaching, learning and assessment procedure, checklist of teaching, learning and assessment is also provided as supporting document of QMS. There are 2 checklists. One is for teaching control checklist and another one is a beneficial stakeholder's appointment and scope of work checklist. For teaching control checklist, there are 10 checklists such as course file checklist, PBL checklist, FYP checklist, IDP checklist and laboratory checklist. The example of the checklist is as Fig. 3.



 <b>FACULTY OF ENGINEERING                      Problem Based Learning (PBL)                      Checklist</b> <span style="float: right;">CT (QM)-FE-07</span>	
<b>1. Problem Based Learning (PBL)</b>	
a) PBL Course Plan (i.e. Trigger, FLA Table)	(CT (QM)-FE-07D(i))
b) Group Distribution	<input type="checkbox"/>
<b>2. Assessments Method</b>	
a) Report Presentation	
i. Report Presentation Rubric	(CT (QM)-FE-03D(ii))
ii. Peer Evaluation Form	(CT (QM)-FE-03D(iii))
b) Oral Presentation/Team Demonstration	
i. Oral Presentation Rubric	(CT (QM)-FE-07D(iii))
ii. Peer Evaluation Form	(CT (QM)-FE-03D(iii))
iii. Supporting Documents (Picture, Presentation slides)	<input type="checkbox"/>
c) Log Book	
i. Log Book Rubric	(CT (QM)-FE-04D(i))
ii. Gantt Chart	<input type="checkbox"/>
iii. Daily/Weekly Progress	<input type="checkbox"/>
iv. FLA Table	<input type="checkbox"/>

Fig. 3: PBL checklist.

For beneficial stakeholder's appointment and scope of work checklist, there are including the external examiner, adjunct professor, industrial advisory panel (IAP), international advisor and invited lecturer/speaker checklist and scope of work. The example of checklist is as Fig.4.

 <b>FACULTY OF ENGINEERING                      INDUSTRIAL ADVISORY PANEL (IAP)                      Checklist</b> <span style="float: right;">CA (QM)-FE-01</span>	
Name: _____	
Designation: _____	
Affiliation: _____	
Email: _____	
<b>1. Criteria:</b>	
<input type="checkbox"/>	Ph.D. in Engineering AND three years of engineering or related experience:
	OR,
<input type="checkbox"/>	Master in Engineering AND five years of engineering or related experience:
	OR,
<input type="checkbox"/>	Bachelor's degree in Engineering or related field AND six years of engineering or related experience:
	OR,
<input type="checkbox"/>	Ten years of engineering or related experience:
	OR,
<input type="checkbox"/>	Any equivalent combination of experience, training and/or education approved by the DEAN of Engineering Faculty
<input type="checkbox"/>	Is currently at related Engineering Companies/Agencies
<input type="checkbox"/>	Has hands-on related expertise in engineering principles, procedures, and/or applications

<b>2. Procedure :</b>	
<input type="checkbox"/>	A complete CV of nominated IAP
<input type="checkbox"/>	Endorsement by the Faculty members
<b>3. Approval:</b>	
<input type="checkbox"/>	Endorsed in Faculty Meeting
<input type="checkbox"/>	Endorsed in Senate Meeting
<input type="checkbox"/>	DVC (academic & international Affairs)
<b>4. Appointment/ Extensions of appointment :</b>	
<input type="checkbox"/>	Invitation letter to the IAP
<input type="checkbox"/>	Letter of response from the IAP
<b>5. Meeting/discussion :</b>	
<input type="checkbox"/>	At least once a year
<input type="checkbox"/>	Submission of Feedback Form/Report by IAP (CA (QM)-FE-01E(ii))
<input type="checkbox"/>	Submission of Improvement Report to IAP by Head of Department
<b>6. IAP Scope of Work:</b>	
<input type="checkbox"/>	Be present at the meeting in Faculty of Engineering or any suitable place decided by the Faculty/Department at least once a year (in one field).
<input type="checkbox"/>	Has active involvement and give commitment as a panel in order to improve curriculum (PEO, PO, Syllabus) implemented by each program.
<input type="checkbox"/>	Assist in strengthening the relationship between University and Industry.
<b>7. CA (QM)-FE-01E(i)</b>	

Fig. 4: Industrial Advisory Panel(IAP) checklist

With the checklist, it helps faculty staff members to do their work faster, more effective and systematic. Besides, it also helps to create quality working environment.

### 3. Conclusion

These 3 documents; Quality Manual, Teaching, Learning and Assessment Manual and Checklist are important in implementation of QMS. It is develop based on faculty's vision, mission and objectives. Thus, in order to ensure the faculty achieve the faculty's vision, mission and objectives, the cooperation between Dean, Deputy Dean, Head of Department and faculty staff members are the most important key of the successful.

### Acknowledgements

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## References

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