This thesis proposed a knowledge management system framework for academic institutions based on academicians’ knowledge sharing behaviour. The current knowledge management systems in higher learning institutions do not capture and represent most of the knowledge types in the academic institutions and little attention has been given to human aspects. A qualitative research approach was employed in this research. This research was carried out in four stages which are: knowledge acquisition; data collection; data analysis and findings; and development of a knowledge management system framework. The research site was at Malaysia’s largest academic institution in terms of size and population. The study discovered two types of knowledge shared among academicians; namely: corporate knowledge and social knowledge. The knowledge sharing networks among the academicians include Community of Practice network, Personal network, and Business Club network. The study also identified two main knowledge sharing methods used by academicians to share knowledge which are synchronous and asynchronous. Five knowledge sharing motivations among academicians were identified: building a reputation, acknowledgement, to be knowledgeable, vision and mission, and reciprocity. The study identified three issues that academicians recommended to be considered. These issues are: offer information about experts, manage and categorize contents, and ensure accessibility. This research contributed toward new knowledge through the development of a knowledge management system framework which drew upon qualitative findings. The administrations of universities may utilize the proposed framework as a guide for their KS activities among academicians.

Image segmentation and object classification processes are gaining importance in image processing applications such as in agricultural area. In general, image segmentation divides a digital image into multiple areas while object classification classifies objects into the correct categories. However, segmentation and classification processes are challenging for images captured in natural environment due to the existence of nonuniform illumination. Different illuminations produce different intensity on the object surface and thus lead to inaccurate segmented images. The low quality of segmented images may lead to inaccurate classification. Therefore, this thesis focuses on the improvement of segmentation methods and development of classification model for images captured in natural environment. Based on the previous researches, most existing segmentation methods are unable to accurately segment images under natural illumination. Therefore, this research has developed three improved methods which are able to segment images acquired in natural environment satisfactorily. The first method is an improved thresholding-based segmentation (TsN), which adds algorithms of inverse process and adjustment on threshold value. However, there is some inconsistency in the segmentation of lighter colour images such as green, yellow, and yellowish-brown. Therefore, another segmentation method has been developed to address the problem. The new method, named as Adaptive K-means, is developed based on clustering approach.