

---

# Knowledge Management in a competitive economy: the Knowledge Management Readiness Score (KMRS)

Nicodemus Nzoka Maingi, Strathmore University, Kenya.

---

## Abstract

Knowledge Management has been touted the ultimate solution to most organizations' competitiveness in this era that is the knowledge edge. The knowledge possessed and used by an organization's personnel could be the difference between its survival or collapse at these times when competition is cut-throat and when today's market leaders could as well be part of the story of the dearly departed if they do not put their acts together. Organizational competition has grown from having the muscle to build new factories and plants or flexing financial or liquidity muscles to learning how an organization can capitalize from improving its processes, on a competitor's mistake, or learning how to collaborate if outright competition will hurt the concerned organizations.

But how should organizations go about knowledge management, where they start?

## Introduction

What drove knowledge management to what it is today?

Over the years, there have been some easy and familiar yet perennial problems for many organizations that have cost these organizations a lot in terms of direct reductions in profitability and delayed achievement of set bottom lines as a result of unanticipated interference with organizational cycles and operations. Such problems include but are not limited to:

- High staff turnovers and poor employee retention rates.
- Poor and slow induction for new employees
- Lack of transparency in how an organization operates which costs organizations a lot.
- Slow decision-making.
- Slow product development & delivery times coupled with poor customer services.
- Reduced revenues due to duplication and redundancy of activities.
- Organizational retarded growth due to the lack of mastery of its core competencies.
- Little, poor or no learning from past activities and projects.

With the advent of office automation, many organizations computerized their operations and there was a seeming improvement in terms of organizational efficiency, accuracy and better ways of producing and managing important information that sped up decision-making. This ushered in the information age.

Over time, the amount of data generated by the organizational activities grew so much to the extent that back ups and archives became a common thing.

In many of these organizations' archives lies a gold mine. Lots of data and information lies buried in magnetic tapes and films in libraries and guarded data vaults. If these data could be retrieved, analyzed and documented, it could steer such organizations to new, unexplored, and almost unassailable competitive positions in their respective industries.

The challenge was how to get all these vast amounts of data and information analyzed meaningfully to the advantage of the concerned organizations. This challenge ushered in the knowledge age. Thus came knowledge management, an old yet relatively new concept. Knowledge discovery and data mining techniques hold a great key to the unraveling of the mystery hidden behind the archived data - hidden trends, patterns and new organizational knowledge are all buried in there. Many database management systems are now being supplied with these tools.

But while the idea of knowledge management is great and seems the natural way to go for many organizations, there is a lack of know-how and expertise to start the process and manage it all along till the organizations reap and appreciate the benefits. These among many other entry barriers present the greatest challenge.

## **What is knowledge management?**

Knowledge Management is derived from organizational knowledge. Knowledge is described as *a set of refined data and/or information that is applicable in certain areas and that can be used in decision-making*. It could also be the familiarity, which is gained by actual experience.

Knowledge Management could be defined as the process of creating value from an organization's intangible assets: Human, Structural and Customer capital.

Knowledge Management (KM) became very popular in the 1990's, with many organizational executives touting it as a great idea. The excitement it had created however died down shortly after due to various reasons, among them being that many organizations took to fixing the famous millennium "bug" as the year 2000 approached.

It has since risen from its ashes, and many organizations are now using it to leverage their competitiveness in their respective industries. Shell, Chevron, and BP Amoco are leading the pack in the oil and energy sector. Celemi consulting became among the first firms to publish its intangible assets as part of its annual report.

Many of the UN bodies have over the year taken to KM in a bid to streamline their worldwide operations. This is thought to be an easy way of bringing about uniformity and efficient execution of their operation in many different parts of the world in which critical operations needed expedition. For instance, the provision of goods and services to war torn or flooded areas, emergency evacuations in case of abrupt instabilities in areas of operation.

## **The motivation and challenge behind this research**

In a bid to bring knowledge management into perspective for many organizations, this research was designed with an aim of establishing some form of footage for organizations intending to measure their level in terms of their readiness to implement and use knowledge management systems to their advantage.

The main objective and motivation behind this research was to bring into focus the need to mould knowledge management as an additional measure of the organizational profitability, sustainability and continuity, besides the known traditional measures that include financial statement analysis such as profit and loss accounts, balance sheets etc. after all we have seen organizations that had very good financial statements and books of accounts go down in days. Enron is one such organization.

By bringing a knowledge management perspective, we bring in a measure of the organization's personnel efforts and their direct contribution towards the eventual profitability. Their efforts are continuous and measurable on a day-to-day basis.

A company can declare profits depending on how its books of accounts are presented, but a lack of knowledge management initiatives cannot be faked – it is either existent or not.

A great deliverable in the study was the development of an index dubbed the *Knowledge Management Readiness Score (KMRS)*, which is a measure on a scale of 0 to 1 of how well an organization is prepared for knowledge management based on six parameters.

## **The research model.**

The research model was made up of six parameters as detailed below;

### **a) *Financial Indicator Analysis***

This traditionally quantitative method focused on well-known financial measures such as financial statements, Return on Investment (ROI), Net Present Values (NPVs), and Tobin's Q. The focus was on financial quantitative aspects i.e. considerations of the cost-benefit analysis derived from setting up initiatives to encourage the sharing of information, experiences, best-practices and for advanced organizations, the use or failure of using a KM system, anticipated savings from the utilization of common organizational knowledge etc.

**b) *Non-Financial Indicator Analysis***

The focus here is on non-quantitative gains. This index measure is related to behavioral factors and system usage, for instance;

- i) "Frequency" of each employee logins to the organizational systems and their consequent learning and gaining of new experiences from using these commonly available information or data.
- ii) How many "times" each employee comes up with a proposal, report, or write-up based on stored and readily available organizational information.
- iii) How many "topics" are in the organizational bulletin board or communities of practice, discussion boards etc?

Focus is on those aspects that could be considered as neither expressly quantitative, qualitative nor expressly financial in nature. For instance, measuring the gain or loss of an opportunity in terms of lost or gained time, lost or gained goodwill, lost or gained business contacts due to using or not using organizational information systems etc.

**c) *Internal Performance Indicator Analysis***

The Internal performance measurement methods focus on internal organizational process and goal achievement efficiency. These methods evaluate knowledge creation and management performance through the gaps between targeted and current achieved levels. The well-known methods include Return on Knowledge (ROK), the Balanced Scorecard (BSC) for organizational personnel, performance-based evaluation, and activity-based evaluation (ABE), among others.

The main focus is on those aspects that pertain to the internal performance and achievement of goals in an organization.

For instance, what procedures, processes exist in the organization, how well do the personnel know them and apply them, how well they are followed to streamline activities and also to achieve organizational objectives.

Others include, faster product development time, better quality of goods and services to customers, the measure of the level of motivation or demotivation and how it affects the employees' work, what keeps the organizational personnel focused and willing to use these tools and follow the documented processes?

**d) *External Performance Indicator analysis***

External performance measurement methods always compare an organization and benchmark it with other companies within its industry such as primary competitors, complementors, or organizations that substitute an organization's goods and services. For example, how well and how often does an organization borrow new and better ways of doing things from others within and without its industry? With benchmarking, best practices are being adopted across industries such that an organization can understand and improve its learning and improvement in a bid to boost its knowledge creation and management performance and easily move forward.

Benchmarking is seen as a tool for identifying, understanding and adopting best practices, in order to increase the operational performance of intellectual capital (IC).

**e) *Project-Oriented Indicator Analysis***

This one measures the impact and success of finished projects' data on future planned projects. It looks at how past projects data can be utilized to help improve the achievement of other future projects, with an overriding commitment to doing the projects better, more cheaply and within budgets, and in time etc.

The more an organization learns from its past projects, the better it becomes in executing future projects and consequently creating a more conducive learning atmosphere for its personnel and consequently mould itself as a learning organization.

Recent studies in Knowledge Management and organizational learning in project environments have emphasized instead the difficulties of learning – not only within individual projects, but also across and between projects. The challenge is to find better ways of documenting finished projects experiences and learning points in a bid to pave way for better execution of future organizational projects.

**f) *Organizational-Oriented Indicator Analysis.***

The organization-oriented analysis is focused on the whole organization; both the multi-dimensional and multi-layeral aspects. It analyzes and evaluates Knowledge Management performance from intellectual capital, the Balanced Scorecard (BSC), technology, and process perspectives. The primary objective is to estimate the level of the efforts to drive and improve knowledge creation and management performance in the whole organization.

It provides a holistic picture by factoring in many aspects that together, they encompass the entire organization.

It explores methodologies such as

- i) Horizontal perspectives which focuses on leadership and direction to the organizational personnel, cultural values and aspects of the organization, technological advances, and process dimensions.
- ii) Vertical perspectives which focuses on strategy development and the involvement of personnel in the development and ownership of such strategies, management and implementation layers of any such strategies, organizational span of control etc.
- iii) A questionnaire was designed based on the above parameters and it was administered to a sampled number of organizations for a pilot run.

A simple summary of the possible attributes of the above organizational classifications is detailed in the table below;

<b>Category</b>	<b>Expected organizational attributes</b>
Category 1 (Scores of between 0 and 33.33%)	<ul style="list-style-type: none"> <li>• Entry level organization in the KM setup initiatives.</li> <li>• Not very well-defined Information/Knowledge-creation and definition systems.</li> <li>• Non-existent, little or not well-defined personnel participation in KM efforts.</li> <li>• KM is not part of organizational culture, contributes little or nothing at all.</li> <li>• There are few or no defined procedures and organizational processes.</li> <li>• KM effort is not people-driven – no personnel participation and ownership.</li> <li>• Possible high employee turnover.</li> <li>• Organizational performance &amp; business continuity is slowed down by employee turnover.</li> <li>• Low employee motivation and participation.</li> <li>• Organizational activities are wholly people-centred - absence of any personnel means nothing moves.</li> <li>• Very little or no return on Knowledge</li> </ul>
Category 2 (Scores of between 33.34 and 66.67%)	<ul style="list-style-type: none"> <li>• Mid-level organization in the KM setup initiatives; fairly experienced and exposed.</li> <li>• Existing and fairly defined information-definition and knowledge-creation systems.</li> <li>• KM partly contributes to organizational culture and to organizational running.</li> <li>• Fair participation of organizational personnel in the Knowledge Management exercise.</li> <li>• Knowledge Management effort is fairly people-driven personnel buy in.</li> <li>• Average (fairly low) employee turnover.</li> <li>• Organizational performance is slightly affected by personnel turnover.</li> <li>• Fair level employee motivation and participation.</li> <li>• Organizational activities &amp; initiatives are fairly people-centred – absence of some personnel is not felt, organizational activities go on uninterrupted.</li> <li>• Fair return on Knowledge</li> </ul>
Category 3 (Scores of between 66.68 and 100%)	<ul style="list-style-type: none"> <li>• High level, quite experienced organization in the KM initiatives – knowledge is very well-defined and understood.</li> <li>• Very well-defined means of reporting and utilization of information.</li> <li>• Mature &amp; well-tested organization procedures &amp; processes for knowledge-creation.</li> <li>• Very low or no staff turnover</li> <li>• KM is a very integral part of organizational culture, and it drives many organizational activities.</li> <li>• Knowledge Management effort is driven by the personnel</li> <li>• Organizational performance is not affected by employee turnover.</li> <li>• Fairly high employee motivation and participation</li> <li>• Organizational activities are not person-centred but on the roles of the particular/concerned officer(s).</li> <li>• Good return on Knowledge</li> </ul>

The results of the survey are as shown below;

### Universities & Academic Institutions

**Table 1: Egerton University**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	48.28%	Category 2
Non-financial Indicator Analysis	24.52%	Category 1
Internal Performance Analysis	47.53%	Category 2
External performance Analysis	35.48%	Category 2
Project-oriented Analysis	64.42%	Category 2
Organizational-oriented Analysis	40.54%	Category 2
<b>Overall Score/classification</b>	<b>43.00%</b>	<b>Category 2</b>

**Table 2: University of Nairobi**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	89.66%	Category 3
Non-financial Indicator Analysis	76.13%	Category 3
Internal Performance Analysis	79.50%	Category 3
External performance Analysis	72.90%	Category 3
Project-oriented Analysis	81.60%	Category 3
Organizational-oriented Analysis	64.25%	Category 2
<b>Overall Score/classification</b>	<b>77.00%</b>	<b>Category 3</b>

**Table 3: Kabarak University**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	51.72%	Category 2
Non-financial Indicator Analysis	29.03%	Category 1
Internal Performance Analysis	41.98%	Category 2
External performance Analysis	32.26%	Category 1
Project-oriented Analysis	35.58%	Category 2
Organizational-oriented Analysis	36.04%	Category 2
<b>Overall Score/classification</b>	<b>38.00%</b>	<b>Category 2</b>

**Table 4: Strathmore University**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	86.21%	Category 3
Non-financial Indicator Analysis	60.00%	Category 2
Internal Performance Analysis	59.88%	Category 2
External performance Analysis	66.45%	Category 2
Project-oriented Analysis	53.37%	Category 2
Organizational-oriented Analysis	51.80%	Category 2
<b>Overall Score/classification</b>	<b>62.00%</b>	<b>Category 2</b>

### Bank & Financial Institutions

**Table 5: Kenya Commercial Bank Ltd.**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	57.24%	Category 2
Non-financial Indicator Analysis	37.42%	Category 2
Internal Performance Analysis	59.88%	Category 2
External performance Analysis	63.23%	Category 2
Project-oriented Analysis	67.48%	Category 3
Organizational-oriented Analysis	53.15%	Category 2
<b>Overall Score/classification</b>	<b>57.00%</b>	<b>Category 2</b>

**Table 6: Stanbic Bank Ltd.**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	57.24%	Category 2
Non-financial Indicator Analysis	46.45%	Category 2
Internal Performance Analysis	38.27%	Category 2
External performance Analysis	63.23%	Category 2
Project-oriented Analysis	81.60%	Category 3
Organizational-oriented Analysis	65.32%	Category 2
<b>Overall Score/classification</b>	<b>59.00%</b>	<b>Category 2</b>

## Energy Sector - Oil companies

**Table 7: Shell Kenya Ltd\***

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	00.00%	Category 1
Non-financial Indicator Analysis	37.50%	Category 2
Internal Performance Analysis	37.50%	Category 2
External performance Analysis	18.75%	Category 1
Project-oriented Analysis	18.75%	Category 1
Organizational-oriented Analysis	22.73%	Category 1
<b>Overall Score/classification</b>	<b>23.00%</b>	<b>Category 1</b>

**Table 8: Chevron Kenya Ltd\*\***

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	71.03%	Category 3
Non-financial Indicator Analysis	32.26%	Category 1
Internal Performance Analysis	53.70%	Category 2
External performance Analysis	45.16%	Category 2
Project-oriented Analysis	00.00%	Category 1
Organizational-oriented Analysis	51.80%	Category 2
<b>Overall Score/classification</b>	<b>43.00%</b>	<b>Category 2</b>

## Airline industry.

**Table 9: Kenya Airports Authority**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	48.28%	Category 2
Non-financial Indicator Analysis	46.45%	Category 2
Internal Performance Analysis	66.05%	Category 2
External performance Analysis	53.55%	Category 2
Project-oriented Analysis	53.37%	Category 2
Organizational-oriented Analysis	85.59%	Category 3
<b>Overall Score/classification</b>	<b>61.00%</b>	<b>Category 2</b>

**Table 10: KLM (Royal Dutch Airlines)**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	86.21%	Category 3
Non-financial Indicator Analysis	67.74%	Category 3
Internal Performance Analysis	47.53%	Category 2
External performance Analysis	53.55%	Category 2
Project-oriented Analysis	31.90%	Category 1
Organizational-oriented Analysis	68.92%	Category 3
<b>Overall Score/classification</b>	<b>60.00%</b>	<b>Category 2</b>

## Industrial & Commercial Sector

**Table 11: Cooper Motor Corporation (CMC)**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	51.72%	Category 2
Non-financial Indicator Analysis	27.74%	Category 1
Internal Performance Analysis	19.75%	Category 1
External performance Analysis	0.00%	Category 1
Project-oriented Analysis	0.00%	Category 1
Organizational-oriented Analysis	16.67%	Category 1
<b>Overall Score/classification</b>	<b>19.00%</b>	<b>Category 1</b>

**Table 12: Kenya Wine Agencies Ltd (KWAL)**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	77.24%	Category 3
Non-financial Indicator Analysis	52.90%	Category 2
Internal Performance Analysis	38.27%	Category 2
External performance Analysis	40.65%	Category 2
Project-oriented Analysis	72.39%	Category 3
Organizational-oriented Analysis	46.40%	Category 2
<b>Overall Score/classification</b>	<b>54.00%</b>	<b>Category 2</b>

## Others – (Various sectors)

**Table 13: Safaricom (K) Ltd.**

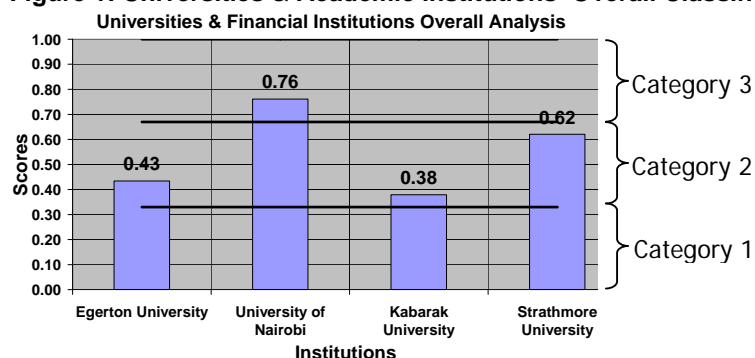
Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	57.24%	Category 2
Non-financial Indicator Analysis	54.84%	Category 2
Internal Performance Analysis	40.12%	Category 2
External performance Analysis	72.90%	Category 3
Project-oriented Analysis	72.39%	Category 3
Organizational-oriented Analysis	40.54%	Category 2
<b>Overall Score/classification</b>	<b>56.00%</b>	<b>Category 2</b>

**Table 14: Industrial & Commercial Development Corporation**

Area of assessment	Area Relative Score	Classification
Financial Indicator Analysis	57.24%	Category 2
Non-financial Indicator Analysis	27.74%	Category 1
Internal Performance Analysis	59.88%	Category 2
External performance Analysis	66.45%	Category 2
Project-oriented Analysis	53.37%	Category 2
Organizational-oriented Analysis	41.44%	Category 2
<b>Overall Score/classification</b>	<b>51.00%</b>	<b>Category 2</b>

## Charted data and analysis

**Figure 1: Universities & Academic institutions' Overall Classification**



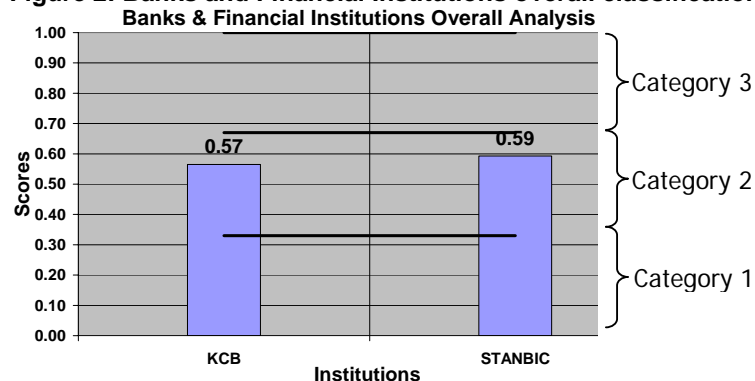
### Discussion and analysis.

For the Universities and academic institutions, there was a mixed outcome. Two of the sampled universities are classified as Category 3 whilst the others are in category 2.

Generally, the observation is that the University of Nairobi is very ready for knowledge management whilst Strathmore has a little more ground to cover before it can have in place all the measures in readiness for Knowledge Management.

Egerton and Kabarak University also have a lot to do even though they are both classified within Category 2.

**Figure 2: Banks and Financial Institutions overall classification**



## Discussion and analysis.

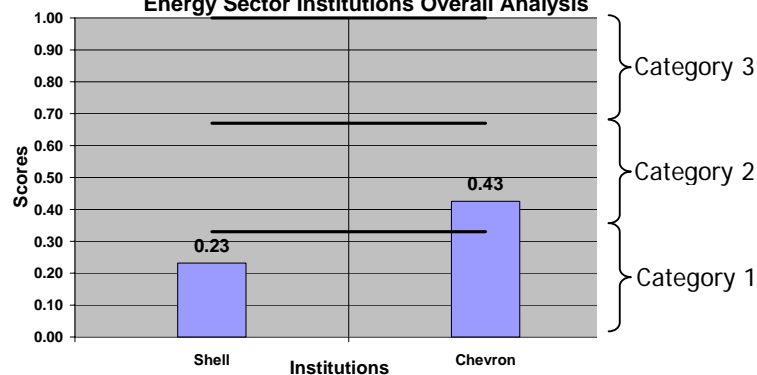
Two banks responded to this study with a generally fair outcome. In the end, both had a category 2 classification, with a little bit more to be done before they get there yet.

In analyzing all the areas of assessment, it was evident that the banks were not far off. The background facts about each bank were brought forth to try and explain these positions and classifications.

The Kenya Commercial Bank is doing very well now and is on an upward turn now. Being the biggest bank in Kenya in terms of spread and distribution of branches and reach to citizens, it had been hounded by many political interferences and manipulations at the expense of its profitability. It has since undergone a rebranding and restructuring programme which has seen it return profits for the first time in many years. More is expected of the bank in the future.

Stanbic Bank on the other hand runs as a private bank with a lot of distribution and operations in other countries in Africa. Its category 2 classification is justified though it was expected to have done much better because of its expansive operations and operations around the world. It is also expected to do much better in the future, with an impending merger with CFC Bank.

**Figure 3: Energy Sector institutions overall classification**  
Energy Sector Institutions Overall Analysis



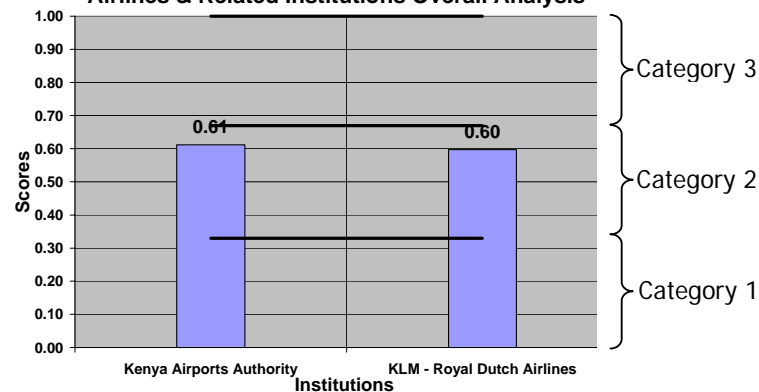
## Discussion and analysis.

This presents among the poorest area scores in this study. Both Shell and Chevron are Knowledge Management powerhouses in the world.

Shell's poor run is as a result of lack of sufficient data as required in this study. Some of the required data was not readily available at the time of this study but it is hoped that in the future studies, the same will be readily available.

Chevron on the other hand did very well only in the Financial indicator analysis, and scored average in the other areas except in the non-Financial indicator analysis in which it scored poorly. Once again this was as a result of unavailability of the required data at the time this study was carried out.

**Figure 4: airline & related institutions' overall classification**  
Airlines & Related Institutions Overall Analysis



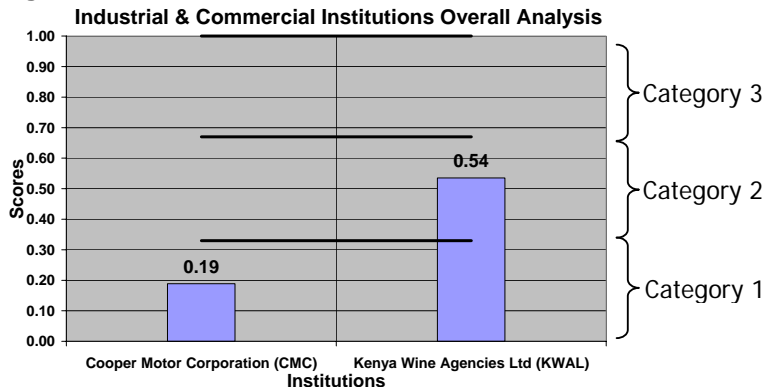


**Discussion and analysis.**

This was among the best scored areas in this study, with both organizations being classified within category 2. Each organization had its very strong areas, most of which were within category 2 except the project-oriented analysis for the Royal Dutch Airlines which scored well below average.

Nevertheless, more was expected from the Royal Dutch Airlines, whose scoring was partly affected by the unavailability of the required data. The Kenya Airports Authority did very well after undergoing some rebranding and restructuring just, and more is expected of it in the future.

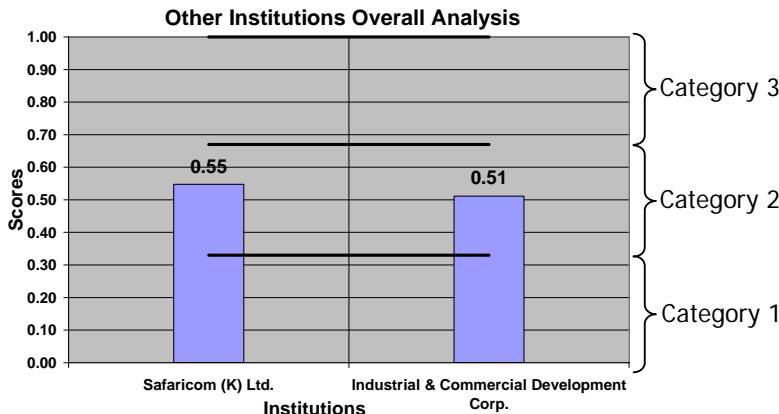
**Figure 5: Industrial & commercial sector institutions overall classification**



**Discussion and analysis.**

This was the poorest scored area. The Cooper Motor Corporation had a lot of missing or insufficient data, which consequently caused its category 1 classification. The Kenya Wine Agencies however came out fairly strongly, with all its scores being within category 2 and above. It did very well in the Financial Indicator Analysis and the Project-Oriented analysis.

**Figure 6: Other institutions' overall classification**



**Discussion and analysis.**

This category was formed by those organizations that were partly or wholly government-owned and run in addition to having unique industries that could not be classified with the others.

Safaricom Limited did well even though more was expected of it, having being the most profitable company for the second year running in the East and Central African Region.

The Industrial and Commercial Development Corporation also did very well after its restructuring programme. It however needs to improve in the Non-Financial indicator analysis.

**Conclusions, general observations and recommendations.**

- a). Many people are still not aware of what Knowledge Management entails or what it means to their organizations. There is need for more awareness and education in this area.
- b). Knowledge Management is mostly driven and pushed by regional companies and multinationals. No local companies and businesses are thinking seriously about

knowledge management. Part of the reason for this is that the Kenyan economy is still opening up to competition but slowly such that many businesses still continue to enjoy huge market and industry shares. For most of these organizations, competition is not yet a threat to their operations.

- c).** Some organizations, still grappling with operational setups don't believe knowledge management is the solution yet. Most have very unstructured forms of organizations and especially private or family-owned set ups. They believe that their businesses are running and growing well even without knowledge management, and they wonder why they should embrace it. Part of the problem here is cultural. If they survival means learning how to compete, why should they embrace knowledge management, whose main underlying driving force is the sharing of that knowledge and information that makes them competitive?
- d).** Most global companies that are leaders in Knowledge Management do not score so well locally i.e. their operations outside their headquarters do not reflect the leadership in this.
- e).** The next round of this study should attract more organizations to participate as a way of making the newly developed Knowledge Management Readiness Score more industry and market representative in addition to brining other big industry players into the knowledge management map.
- f).** The continuous and ongoing efforts by the Kenyan government to restructure most of the parastatals and state-owned corporations is seemingly bearing fruit as demonstrated by two such organizations that were part of the sample for this study.

## ***References***

- (Madanmohan, R, 2003, Leading with knowledge KM Chronicles: Travelogue 1)
- (Groff, T.R., Jones, T.P., 2003, Introduction to KM: KM in Business)
- (Nonaka, I., Takeuchi, H., 1996, The Knowledge-Creating Company: How Japanese Companies Create the Dynamics).
- (Liebowitz, J., 1999, Key ingredients to the success of an organization's KM strategy, Knowledge and Process Management )
- (Mutinda, T., 2001, Roadmap to e-government: a Kenya case study, University of Nairobi)
- (Santonus, M., Surmacz, J., 2003, The ABCs of Knowledge Management)
- (Bagaka, H., 2002, Assessment of electronic government in Kenya, University of Nairobi)
- (Chen A., Chen M, 2005: 4-12, Journal of Universal KM, A Review of Survey Research in Knowledge Management Performance Measurement: 1995-2004).
- (Donoghue, L. P., Harris, J. G., Weitzman, B. E., 1999, Outlook Journal: Knowledge management strategies that create value)
- (Derr, K.T., 1999, Knowledge Management World Summit proceedings: Managing Knowledge the Chevron Way)
- (Louise, F., 2001, CIO: Acquisition Spree Leaves Marconi in Need of Knowledge Management)
- (Davenport T. H., Prusak, L., 1998, Working Knowledge: How Organizations Manage What They Know)
- (Robertson, J., 2001, Knowledge management project for Roads and Traffic Authority (RTA))
- (Levinson, M., 2007, CIO: ABC - An Introduction to Knowledge Management (KM))