Iranian Journal of Management Studies (IJMS) *http://ijms.ut.ac.ir/*
Vol. 9, No. 2, Spring 2016 *Print ISSN: 2008-7055*
pp. 243-264 *Online ISSN: 2345-3745*

A comparative analysis of IT outsourcing readiness in the East African community

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(Received: 29 September, 2015; Revised: 13 December, 2015; Accepted: 26 December, 2015)

Abstract

Developing countries are increasingly relying on Information and Communication Technology (ICTs) for their socio-economic development. Many countries have achieved faster gross domestic product (GDP) growth through information technology (IT) outsourcing, which is now largely recognized as a strategic management practice that can provide a competitive advantage in business. The East African Community (EAC) member states are putting in place policies to help improve their overall ICT environment competitiveness. This paper evaluates the current state of IT outsourcing readiness in the EAC countries, and contributes to the outsourcing body of knowledge by establishing a relation between a country's Networked Readiness Index (NRI) and its readiness for IT outsourcing. This evaluation is performed based on the PROMETHEE method which is very effective at dealing with multi-criteria decision making problems. The results show that Kenya is the most ready country for IT outsourcing in EAC, followed by Rwanda, Uganda, Tanzania, and Burundi.

Keywords

Developing countries, East African Community, IT outsourcing, Offshoring, PROMETHEE.

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Introduction

When organizations choose to move their IT services to low-cost countries, they are daunted by the task of determining which country or group of countries would be the best place to host their operations (Gartner, 2008). Currently, there are very few studies that address the IT outsourcing (ITO) problem at country level, most previous works deal with it at firm level. One of the most important contributions of our paper is to address the ITO question from a different angle, by comparing a group of countries and analyzing their readiness for ITO.

Emerging and developing countries are competing to host offshore IT operations from developed countries. East Africa was, until recently, one of the least digitally connected regions in the world; however, it is now experiencing a digital revolution brought about by the construction from the year 2010, of three sub-sea fiber-optic cables, which is radically changing the EAC population's way of life.

A number of developing countries have opted to increase global GDP through their IT outsourcing sectors. Countries in the EAC bloc, especially Kenya and Rwanda, have taken measures to advance their ICT sector's global competitiveness. One example of such measures is the establishment of IT hubs, following the model of Silicon Valley (Kenya's iHub and East Africa Data Center, Rwanda's kLab, etc). These two countries have now become technology success stories.

The potential impact of ICTs for economic development in the EAC is evident. As an example, Rwanda has already completed more than 3,200 km of fiber-optic network, connecting more than 230 government institutions in the whole country. The role of ICT in overall development has been proved by different studies (World Bank, 2009).

Globalization and ICT have brought opportunities that did not exist before to low income countries (Abbott, 2013). One of those opportunities is IT outsourcing, which is defined as the transfer of part or all of the IT functions of a firm to an external provider. IT outsourcing has reached a mature stage in developed countries, but it is still not well implemented in developing countries. Most developing

countries have set their economic growth targets expecting ICT to play a major contributing role in their annual GDP growth. Countries like Kenya made plans to raise the IT share of total GDP from 5% up to 35% (Waema, 2008). Some developing countries are already experiencing a big contribution from their IT sector to the total GDP growth. One example is Ethiopia which reports that its IT sector contributes about 11% of the total country GDP (Nduwimfura & JianGuo, 2015b).

There have been reports of many benefits from IT outsourcing, but the most common ones include cost reduction through economies of scale and risk minimization, gaining competitive advantage, accessing skilled workers not available in-house, access to state-of-the-art technology, gaining more flexibility, etc. EAC countries are trying to take advantage of the possibilities offered by offshore outsourcing as an export industry.

There are nevertheless risks associated with IT outsourcing, they include the loss of control and ownership of IT strategy, the security of data, the risk of outsourcing partner getting out of business, hidden costs, the provider failing to meet agreed upon service level agreements (SLAs), the unavailability of critical systems, etc.

In Rwanda, the convergence of four factors unique to Rwanda drove ICT development quicker than the other sub-Saharan African countries: (1) educated emigrants and refugee returnees, (2) networking with communities, (3) political leadership, and (4) an under-contested political environment (Lacity & Rottman, 2008). Rwanda may indeed provide a model of leadership in ICT capabilities for other sub-Saharan African countries to follow.

One of the most famous IT innovations made in the East African Community is the mobile money transfer application M-PESA, which has revolutionized financial transactions for millions of users around the world.

The objective of this paper is to make a comparative analysis of the IT outsourcing environment readiness in the five member states of the EAC based on the PROMETHEE methodology. This analysis is done by establishing a relationship between a country's networked

readiness index (NRI) and its readiness for IT outsourcing. The paper concludes by making propositions for the improvement of the overall IT environment in the EAC bloc in order to attract more businesses in the IT outsourcing sector.

In this paper, we propose a PROMETHEE-based methodology for the analysis of a country's readiness for IT outsourcing in the case of developing countries. These countries often present very incomparable criteria, they may perform very well on one criterion but at the same time, perform very badly on another criterion. The PROMETHEE method has the ability to effectively manage incomparability by its compensatory effects. We propose a set of ten criteria suitable for evaluating developing countries 'readiness for ITO.

Theoretical background and literature review

The most prominent theory behind outsourcing, has been transaction cost theory. Transaction cost theory has been viewed as primarily addressing the "make-or-buy" question. It helps decide whether companies should make or buy resources.

Williamson (1975, 1981) suggested that transactions should be organized within a firm when the cost of doing this is lower than the market. It is often said that the ideas of Coase (1937) and Williamson on the transaction cost theory are the prominent ideas behind outsourcing.

Transaction cost theory can be seen as the underlying theory behind outsourcing; however, it is still insufficient in terms of explaining the extent of the current outsourcing phenomenon into which outsourcing has evolved.

According to Transaction Cost Theory, firms will seek to economize on the costs of participating in markets, known as the "transaction costs".

Information technology is believed to lower transactions costs for firms, allowing them to transact with other firms instead of growing their size by hiring more employees and adding new departments or divisions.

Transaction cost theory deals with asset specificity, overall cost

advantage, the threat of opportunistic vendor behavior, and the complexity of the transaction (Bahli & Rivard, 2003; Martens & Teuteberg, 2009).

In their research, Poppo and Lacity (2006) found that managers who followed Transaction Cost Economics principles had better success with their sourcing decisions. Managers realized higher performances when they applied the following TCE principles:

1. To not outsource the most specialized activities.
2. To measure and benchmark outsourcing activities.

Abbott (2013) provides an overview of offshore outsourcing and identifies factors affecting offshore outsourcing success in low-income countries. The author suggests that African countries should consider two sub-strategies: low-end business process outsourcing (BPO), taking advantage of abundant resources before attempting more advanced modes suitable to higher-end knowledge workers; and impact sourcing (socially responsible outsourcing). She adds that in regions with special abilities such as mathematical abilities (e.g. Ethiopia), information technology outsourcing (ITO) work could be considered. She concludes that future research in this area would benefit from adopting frameworks that not only address economic indices of development but also those that carefully address sustainability issues.

Geoff and Sundeep (2006) assessed the landscape of the information systems (IS) research literature concerned with developing countries by examining a range of research articles published from the year 2000 to 2004. They argued that the question we faced by the time was no longer whether information and communication technologies (ICTS) were relevant to developing countries, as it used to be asked, but it rather was how could ICTs, be beneficial to developing countries.

Nduwimfura and JianGuo (2015a) provided a model for offshore information systems outsourcing provider evaluation and selection in developing countries, through a case study of eight Africans countries, based on PHOMETHEE methods.

Several researchers have investigated the reasons why firms choose

to outsource their information systems/information technology (IS/IT) functions, and the risks involved in IT outsourcing.

Chen, Wang and Wu (2011) stated that wrong IS outsourcing decisions are one reason that causes IT outsourcing failure. They stated that the reasons behind outsourcing were access to specialized technology and operational platform, staff reduction, and the provision of efficient procurement services. In their research, they identified five drivers of IS outsourcing: cost reduction, focus on core competencies, liquidity needs, IS capability factors, and environment factors.

Claver, González, Gascó and Llopis (2002) identified the following reasons for outsourcing: cost reduction, increasing the flexibility of the IS department, focusing on the IS strategic issues, eliminating troublesome problems, reducing technology cost, improving IS quality, increasing access to new technology, and decreasing risk.

Gonzalez, Gasco and Llopis (2005, 2009) explored the reasons behind IS outsourcing in the particular context of the largest Spanish firms. They found that outsourcing gave the firms the possibility of enhancing their information systems services and departments.

Gonzalez *et al.* (2010), studied the main reasons of IS outsourcing and risks faced by IS clients. They carried out this study from the client perspective, and concluded that three major reasons factors motivated IS outsourcing: strategic reasons, technological reasons, and economical reasons. The same study found that there are three major risk factors affecting IS outsourcing: outsourcing generic risks, risks derived from the lack of trust on the provider, and risks derived from the client.

After reviewing IS outsourcing literature, Lacity, Khan and Willcocks (2009) stated that client readiness, good strategy, good process, sound contracts, and good relationship management are the key success factors of IS outsourcing success.

Other studies analyzed the critical success factors for information systems outsourcing management. Agourram (2009) explored how IS success is defined by a group of managers in Germany. The results of this study showed that culture does influence the perception of IS success.

Al-Ahmad and Al-Oqaili (2013) stated that outsourcing IS services is considered a strategic decision for many organizations because it is a risky endeavor. The authors provided a conceptual framework that can help implement both outsourcing and back-sourcing successfully.

AR (2012) investigated the problem of IS outsourcing effectiveness through the identification of the determinants of IS outsourcing effectiveness, together with the relationships among those determinants.

Gorla and Chiravuri (2011) presented a model of IS outsourcing success through analyzing empirical papers published on IS outsourcing success. They also identified the neglected areas of research in IS outsourcing success through meta-analysis of published papers.

Smuts, Merwe, Kotzé and Loock (2010) identified the critical success factors for the management of an IS outsourcing project. They used these critical success factors as an input to the design of a new outsourcing arrangement to pro-actively inform specific project activities and to identify and mitigate project risk.

Waheed and Molla (2004) addressed the factors that affect outsourcing success in terms of project success, knowledge transfer and sustainability.

Most of the abovementioned works addressed the determinants, the success factors, and risk factors of IS/IT outsourcing. Very few studies addressed the IS/IT outsourcing question from the developing countries' perspective, and when they did, it was often done at firm level, not at country level. Our work's intention is to address this gap by providing an ITO study from both the developing countries' and country level perspectives.

Our research has been done based on the Networked Readiness Index (NRI) produced by the World Economic Forum, which has been monitoring ICT progress in the world for more than a decade. The NRI is an index that comprises ten sub-indexes grouped in four categories: the environment sub-index that has two criteria (political and regulatory environment, and business and innovation environment), the readiness sub-index with three criteria

(infrastructure and digital content, affordability, and skills), the usage sub-index divided into three criteria (individual usage, business usage, and government usage), and finally, the impact sub-index that is divided into two criteria (economic impacts, social impacts). These four sub-indexes respectively measure the environment for ICTs; the readiness of a society to use ICTs; the actual usage of all main stakeholders; and, finally, the impacts that ICTs generate in the economy and in society.

The NRI provides policymakers, business leaders, and concerned citizens with valuable insight into current market conditions and the state of connectivity across the world, and helps to identify where more can be done to accelerate the Internet of Everything's positive impact on the world in which we live (World Economic Forum, 2014). It is these 10 sub-indexes of NRI that make the evaluation criteria for this research. We chose these criteria because they provide a comprehensive understanding of the ICT environment in any given country, especially in developing countries.

Our research completes these previous works by providing a comparative analysis of IT outsourcing readiness in the context of a regional bloc (the East African Community) at country level. The conclusion is that some EAC (developing) countries in our study are ready to take on IT outsourcing work (Kenya and Rwanda), while others still have a lot to do in order to become competitive on the IT outsourcing market (Uganda, Tanzania and Burundi).

Methodology and data sources

Methodology

The methodology chosen for this study is PROMETHEE, which stands for Preference Ranking Organization Method for Enrichment Evaluations. This method was developed by Brans in 1982, and then was extended twice, first by Brans and Vincke in 1985 and second by Brans and Mareschal in 1994. It is an outranking method that belongs to the family of Multi-Criteria Decision Aid methods (MCDA).

MCDA represents an approach that has a goal of ordering different

options, from the most preferred to the least preferred, where no single option is obviously the best on all criteria. It is often used to solve problems where we have to make a choice among different alternatives. MCDA is useful for dividing the decision into smaller, more understandable parts, analyzing each part, and integrating the parts, to produce a meaningful solution.

PROMETHEE belongs to the family of outranking methods, which are mainly characterized by their compensatory effect. This effect states that one disadvantage (weakness) presented by one criterion can be compensated by one advantage (strength) presented by another criterion. The degree to which one option is dominant over another is indicated by outranking (Vincke, 1992).

PROMETHEE is classified as a decision support system which deals with the appraisal and selection of a set of options on the basis of several criteria, with the objective of identifying the pros and cons of the alternatives, and obtaining a ranking among them (Kasperczyk & Knickel, 2011). It has been widely used to solve different multi-criteria decision making problems.

Common applications of PROMETHEE methods include the evaluation of different decisions presenting several often conflicting criteria, the identification of the best solution or alternative, the ranking of solutions from the best to the worst, sorting items into predefined classes, presenting a better understanding of difficulties surrounding the process of decision making, reaching a consensus decision under the presence of different decision makers who have different conflicting points of view, the justification or invalidation of bad decisions based on objective elements (Nduwimfura & Zheng, 2015a).

The PROMETHEE methodology relies on the definition of preference functions and weights to model the preference and priorities of the decision maker.

The PROMETHEE rankings are calculated in 2 steps:

Step 1. Assigning a preference function:

The starting point is the evaluation matrix, which presents the

performance of each alternative in relation to each criterion. Using the data contained in the evaluation matrix, the alternatives are compared pairwise with respect to every single criterion. The results are expressed by the preference functions, which are calculated for each pair of options and can range from 0 to 1. Whereas 0 means that there is no difference between the pair of options, 1 indicates a big difference.

Step 2. Estimating the outranking degree of the options:

A matrix of global preferences is calculated by multiplying the preferences by the criteria's weights and adding the single values. In this matrix, the sum of the row expresses the strength of an alternative (dominance), whereas the sum of the column expresses how much an alternative is dominated by the other ones (sub-dominance). A linear ranking is obtained by subtracting the sub-dominance value from the dominance value.

Decision makers have the responsibility of assigning weights on different criteria and choosing a preference function. Sensitivity analyses can be used to clarify how much influence the chosen weights have on the output.

The main advantage of using PROMETHEE methods is that they can deal with qualitative and quantitative data simultaneously, and have the ability to avoid incomparability. Another advantage of PROMETHEE is its ability to deal with uncertain and fuzzy information.

PHOMETHEE methods have evolved into five different methods: PROMETHEE I for partial ranking of the alternatives, PROMETHEE II for complete ranking, PROMETHEE III for ranking problems involving interval alternatives, PROMETHEE IV for both partial and complete rankings, and PROMETHEE V for dealing with problems having specific constraints.

Let's consider a problem where A is a set of possible actions, and A= $\{a_1, a_{2...} a_n\}$.

The actions are evaluated on k criteria, i.e. F= $\{f_1, f_2... f_k\}$.

Two actions *a* and *b* are compared on a single criterion as follows:

$$d_k(a,b) = f_j(a) - f_j(b) \quad (1)$$

where $d_k(a,b)$ is the difference between actions a and b under the k^{th} criterion.

This difference is then used in the preference function $P_j(x)$. There are six different types of preference functions:

- The Usual: suitable for a criterion with few very different evaluations, usually qualitative criteria,
- The U-shape which introduces the notion of indifference threshold,
- The V-shape which is a special case of the Linear preference function where the Q indifference threshold is equal to 0,
- The Level: it is better suited to qualitative criteria when the decision-maker wants to modulate the preference degree according to the deviation between evaluation levels,
- The Linear: the best choice for quantitative criteria when a Q indifference threshold is wished,
- And the Gaussian which is an alternative to the Linear and has a smoother shape, but is more difficult to set up because it relies on a single S threshold that is between the Q and P thresholds, and has a less obvious interpretation.

The preference function used in this study is the V-shape, special case of the linear preference function, the most often used in solving MCDA problems, which can be described as follows:

$$P_k(x)\begin{cases} 0 & if\ x \le q_k \\ \frac{x-q_k}{p_k-q_k} & if\ q_k \le x \le p_k \\ 1 & if\ x > q_k \end{cases} \quad (2)$$

where q_k represents value of an indifference threshold; p_k represents value of a strict preference threshold.

The value of $P_k(x)$ ranges from 0 to 1. A value of $P_k(x)$ close to 0 indicates that action a is not strictly preferred to action b. A value of $P_k(x)$ close to 1 indicates that action a is strongly preferred compared to action b.

After estimating the weight for each criterion, the positive and

negative flows (Phi+ and Phi- respectively) can be defined, and a multi-criteria preference degree equation is introduced as follows:

$$\pi(a,b) = \sum_{k=1}^{q} P_k\,(a,b).w_k \qquad (3)$$

where w_k represents weight of criterion f_k, assuming the sum value of w_k is 1:

So that:

$\pi\,(a, b) \approx 0$ means that there is a weak preference for *a* over *b*.

$\pi\,(a, b) \approx 1$ means that there is a strong preference for *a* over *b*.

The following properties hold:

$$\begin{cases} \pi(a,a) = 0 \\ 0 \le \pi(a,b) \le 1 \\ 0 \le \pi(a,b) + \pi(b,a) \le 1 \end{cases} \qquad (4)$$

The benefit of outranking methods is that they are based on a more familiar way of thinking.

Two outranking flows are determined in order to explore the performance of each alternative ranking against the remaining *n-1* alternatives:

The positive (or leaving) flow:

$$\phi^{+}(a) = \frac{1}{n-1}\ \sum_{x \in A} \pi(a,x) \qquad (5)$$

The negative (or entering) flow:

$$\phi^{-}(a) = \frac{1}{n-1} \sum_{x \in A} \pi(x,a) \qquad (6)$$

The positive flow indicates how much one alternative is dominant over the others, whereas a negative flow illustrates how much an alternative is dominated by others.

In PROMETHEE I, a partial ranking is defined as follows:

a is preferred to *b* iif. $\phi^{+}(a) > \phi^{+}(b)$ and $\phi^{-}(a) < \phi^{-}(b)$;

a is indifferent to *b* iif. $\phi^{+}(a) = \phi^{+}(b)$ and $\phi^{-}(a) = \phi^{-}(b)$;

a is incomparable to *b* iif. $\phi^{+}(a) > \phi^{+}(b)$ and $\phi^{-}(a) > \phi(b)$, or $\phi^{+}(a) < \phi^{+}(b)$ and $\phi^{-}(a) < \phi^{-}(b)$.

PROMETHEE II is a complete ranking, which combines both

positive and negative flow. The net flow is calculated as follows:

$$\phi(a) = \phi^{+}(a) - \phi^{-}(a) \quad (7)$$

Therefore:

a is preferred to b iif. $\phi(a) > \phi(b)$;

a is indifferent to b iif. $\phi(a) = \phi(b)$;

Additionally, $\phi_j(a) = \phi_j^{+}(a) - \phi_j^{-}(a)$ represents the net flow for action a under criterion j. All the individual net flows of the alternatives under each criterion can be summarized in a net flow matrix as shown in Table 1.

Table 1. The net flow matrix

	$\phi_1(a)$	$\phi_2(a)$	⋯	$\phi_j(a)$	⋯	$\phi_k(a)$
a_1	$\phi_1(a_1)$	$\phi_2(a_1)$	⋯	$\phi_j(a_1)$	⋯	$\phi_k(a_1)$
a_2	$\phi_1(a_2)$	$\phi_2(a_2)$	⋯	$\phi_j(a_2)$	⋯	$\phi_k(a_2)$
⋯	⋯	⋯	⋯		⋯	⋯
a_i	$\phi_1(a_i)$	$\phi_2(a_i)$	⋯	$\phi_j(a_i)$		$\phi_k(a_i)$
⋯	⋯	⋯	⋯		⋯	⋯
a_n	$\phi_1(a_n)$	$\phi_2(a_n)$	⋯	$\phi_j(a_n)$		$\phi_k(a_n)$

where a_i represents one action and $\phi_j\ (a)$ is the evaluation of action a on criterion j. The matrix provides information related to the performance of alternatives, and is used in the PROMETHEE and GAIA (Graphical Analysis for Interactive Aid) process.

The model used in this work (Fig. 1) is a slightly modified version of the model used in (Nduwimfura & JianGuo, 2015a) who focused on modeling outsourcing provider selection in case of developing countries, whereas this study focuses on comparing the readiness for IT outsourcing environments in developing countries. The criteria upon which EAC countries are evaluated are: political and regulatory environment, business and innovation environment, infrastructure and digital content, affordability, skills, individual usage, business usage, government usage, economic impact, and social impact.

This analysis is performed using the software Visual PROMETHEE 1.4.0.0 and the results are shown in the following paragraphs.

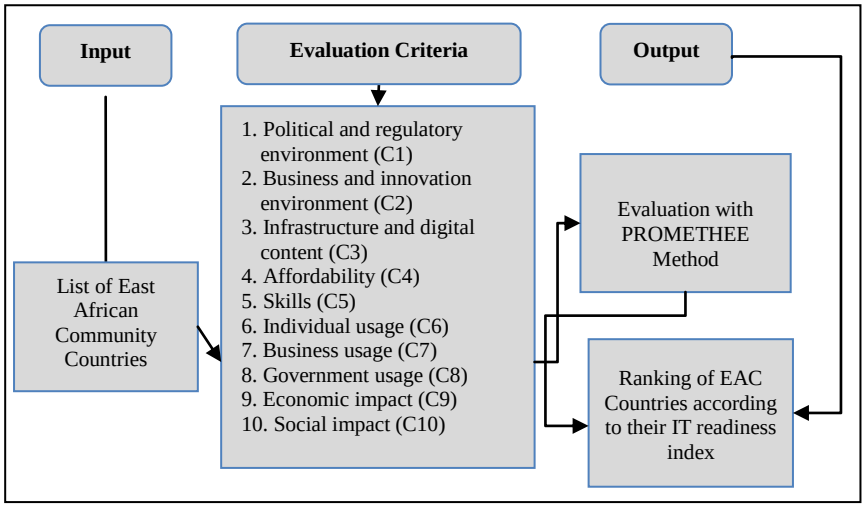

Fig. 1. Evaluation model

Data sources

Data used in this study was obtained from the World Economic Forum report, 2014 edition. This report is entitled "The Global Information Technology Report 2014: Rewards and Risks of Big Data" (Bilboa-Osoria, 2014). The data was used with permission from World Economic Forum, Global Competitiveness and Benchmarking Network.

Findings and Discussion

Evaluation table

The evaluation table (Table 2) includes different actions (countries), the criteria on which they are evaluated, and the values for those criteria.

Table 2. Evaluation table

Criteria / Actions	Political & Reg. Env	Business & Innov. Env	Infrastructure	Affordability	Skills	Ind. Usage	Bus. Usage	Gov. Usage	Eco. Impacts	Social Impacts
Burundi	2.40	3.00	2.10	n/a	2.40	1.30	2.40	2.60	2.20	2.00
Kenya	3.70	3.80	3.40	4.70	4.30	2.30	3.80	4.40	3.40	3.50
Rwanda	5.20	4.50	3.00	3.10	3.30	1.70	3.50	5.00	3.50	4.10
Tanzania	3.50	3.40	2.70	4.00	2.80	1.70	3.10	3.70	2.50	2.90
Uganda	3.60	3.60	2.90	5.70	2.90	1.60	3.10	3.70	2.60	3.00

Phi, Phi+ and Phi- values

The following figure (Table 3) shows the different Phi, Phi+ and Phi- values for the five actions in our scenario. These values are used to determine the PROMETHEE I and II rankings.

Table 3. Phi, Phi+, and Phi- values

Rank	Action	phi	Phi+	Phi-
1	**Kenya**	0.4826	0.5510	0.0684
2	**Rwands**	0.4043	0.5165	0.1121
3	**Uganda**	-0.0434	0.2036	0.2471
4	**Tanzania**	-0.1850	0.1296	0.3146
5	**Burundi**	-0.6586	0.0000	0.6586

PROMETHEE I and II rankings

The following figures show the PROMETHEE I (Fig. 2) and II (Fig. 3) rankings of the five EAC countries. The rankings are consistent for both methods.

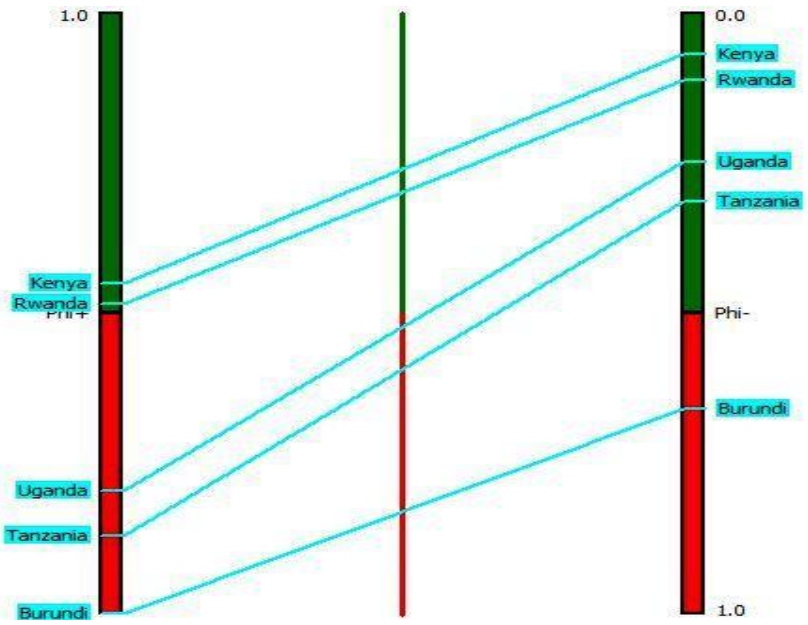

Fig. 2. PROMETHEE I ranking

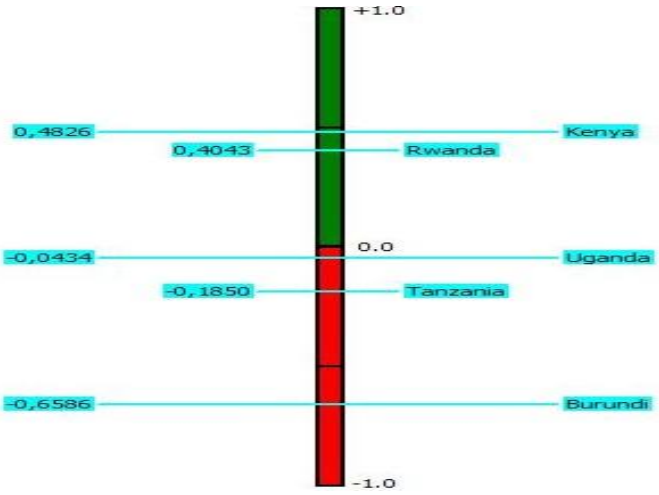

Fig. 3. PROMETHEE II ranking

Findings and discussion

The results from PROMETHEE I ranking are consistent with those of PROMETHEE II. They show that among the five countries, Kenya has the highest Phi score, it is therefore the most ready for IT outsourcing, followed by Rwanda. In third position comes Uganda, then Tanzania, and lastly comes Burundi.

Figure 4 shows the PROMETHEE rainbow view, which is a disagregated view of PROMETHEE II complete ranking.

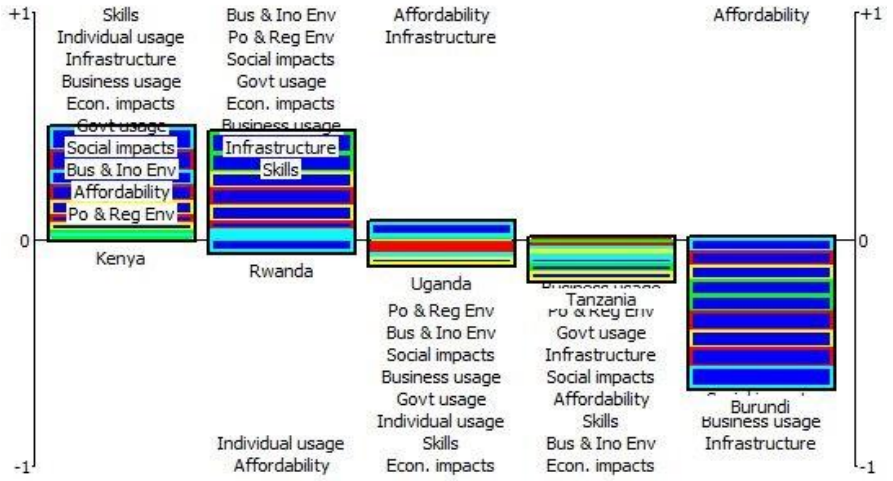

Fig. 4. PROMETHEE Rainbow view

We can see that Kenya, which is on top of the ranking, performs very well on all ten criteria. It has a positive score (Phi value) on all criteria. Rwanda has positive scores except on two criteria, individual usage and affordability on which it gets negative scores. Uganda has negative scores on all criteria except for affordability and infrastructure. Tanzania has negative scores for all ten criteria, and Burundi has a positive score on one criterion only, affordability. In order to become more competitive in the IT outsourcing market, the least performing countries Uganda, Tanzania, and Burundi need to work hard to improve those criteria on which they got negative Phi values respectively.

Similar studies have been done to identify the leading destination countries for offshore services (Marriott, 2007). In this research, the Gartner Group identifies which 30 countries top the list of most attractive places for offshore services each year based on ten criteria. The 10 criteria are: language, government support, labor pool, infrastructure, educational system, cost, political and economic environment, cultural compatibility, global and legal maturity, and data and intellectual property security and privacy. In their 2010-2011 study, they found that the top 30 countries were exclusively emerging nations. It is therefore worth studying the outsourcing phenomenon from an emerging or developing countries' perspective.

Our work is similar to (Marriott, 2007) in a way, but focuses more on comparing the performance of each country in terms of their readiness for IT outsourcing services. The criteria used in our study are different from theirs, although a number of common criteria can be found in both studies such as infrastructure, political and economic environment, skills (labor pool), cost (affordability), global and legal maturity(regulatory environment).

Another study by Tholons (2012) identified the top 100 outsourcing destinations cities in the world, reflecting the dynamic shifts occurring across regional outsourcing landscapes. The study found that there were more opportunities to unfold in the global services outsourcing industry, with tighter competition along the way. They added that African destinations would distinguish themselves

from Middle Eastern cities as the former show promising economic and infrastructure developments that could boost investor confidence.

Our research can help sourcing managers select the right offshore locations as part of a global sourcing strategy. Insights from our study can also help less performing countries improve their competitiveness by taking measures to improve those criteria on which they got bad scores.

Sensitivity analysis

The sensitivity analysis (Fig. 5) helps us check how much the PROMETHEE rankings are affected by the weights of the criteria. It helps us answer the questions "what if more weight is given to the criterion 'x'? How does that affect the global ranking?"

In Visual PHOMETHEE, we can view the sensitivity analysis using the visual stability intervals window.

At the beginning, all criteria are given an equal weight of 10%, then weights are modified for each criterion to see the impact on the global ranking.

The rankings are consistent with the equal weights rankings (10% for each criterion) for any variation of the following criteria: infrastructure, skills, and business usage. The three criteria are not affected by any weight variation, the final ranking is consistent no matter what values are given to their weights.

For five other criteria, when the weights increase up to a certain percentage, the rankings change in favor of Rwanda which become the best option, surpassing Kenya. This situation happens for the following criteria "political and regulatory environment (for weights>= 17.62%)", "business and innovation environment" (for weights>= 18.93%), "economic impacts" (for weights>= 52.04%), "social impacts" (for weights>= 24.73%), and "government usage" (for weights>= 26.65%).

Tanzania passes Uganda to take the 3rd place when the criterion "individual usage" is given the weights of 50.42% and above.

The variations for the criterion "affordability" are the most remarkable, the ranking changes five times with the increase of

weights: at 35.52%, Uganda becomes second, passing Rwanda, at ±61% Uganda passes Kenya, at ±65% Tanzania passes Rwanda, at ±70% Burundi passes Rwanda, at ±76% Burundi passes Tanzania.

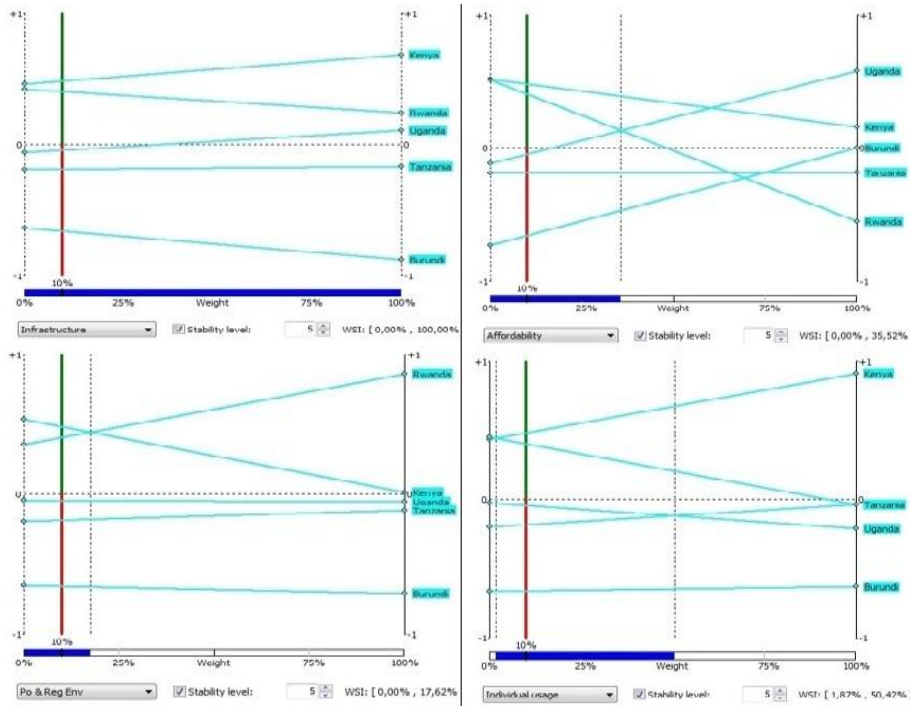

Fig. 5. Sensitivity analysis

Table 4 shows the stability intervals (zones in which the ranking is stable and consistent) for different criteria.

Table 4. Visual stability intervals

Criteria	Stability Interval
Political and regulatory environment	[0,00% , 17,62%]
Business and innovation environment	[0,00% , 18,93%]
Infrastructure and digital content	[0,00% , 100,00%]
Affordability	[0,00% , 35,52%]
Skills	[0,01% , 100,00%]
Individual usage	[1,87% , 50,42%]
Business usage	[0,00% , 100,00%]
Government usage	[0,00% , 26,65%]
Economic impact	[0,00% , 52,04%]
Social impact	[0,00% , 24,73%]

Conclusion and Recommendations

This paper analyzed the readiness for IT outsourcing in the East African Community region, which is an organization made of five member states: Rwanda, Uganda, Burundi, Kenya and Tanzania. The analysis was done at country level instead of firm level because the objective was to assess each country's readiness for the IT outsourcing market.

A careful analysis of IT outsourcing readiness in the East African Community shows that all five countries in the community are doing tremendous reforms in order to improve their competitiveness on the IT outsourcing market. Kenya and Rwanda have the best performance, they are the most ready countries to take on IT outsourcing projects in the region while Uganda, Tanzania, and Burundi still have a lot to improve in order to become more competitive on the IT outsourcing market. They need to improve all the criteria on which they got negative scores.

PHOMETHEE methods have proved to be well suited for analyzing how a country performs in terms of IT outsourcing readiness, compared to other countries.

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