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The Intervening Influence of Innovation Culture on the Relationship between NIS Factors and Institutional Linkages in the National Innovation System in Kenyan ICT Innovation Firms

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ABSTRACT

National Innovation System (NIS) is the set of institutions and their linkages that allow movement of information and technology among organizations and persons which is vital to the innovative undertakings on the national scale. NIS is based on assumption that encourages interconnectedness among the parties participating in innovation which is necessary for increasing economic growth and technological performance. The study aims to explore the influence of innovation culture on the relationship between NIS factors and institutional linkages in the NIS in Kenyan ICT innovation firms. The study attempts to address the question: what is the influence of innovation culture on the relationship between NIS factors and institutional linkages in the NIS in Kenya. This research study adopted cross-sectional survey design. The study targeted 112 Kenyan ICT innovation institutions via census whose outcome was 73 institutions that responded within the study timeframe. The research study used semi-structured questionnaire with both closed and open-ended questions as well as path analysis with multiple regression analysis. The study established that innovation culture had an intervening effect on the relationship between NIS factors and institutional linkages in the NIS in Kenya.

Keywords: *NIS factors, Institutional Linkages, ICT innovation institutions, Innovation culture, Technological and Performance*

INTRODUCTION

Institutional linkages within NIS are influenced by such factors as interconnectedness, systems to generate, carry and disseminate knowledge and capacity, among others (Murray et al., 2010). Proper incentives including fiscal, monetary and regulatory policy measures strengthen linkage dynamics between institutions, technologies and knowledge generation by connecting economic and non-economic actors (Altenburg, 2013).

A culture supporting innovation (termed as a pro-innovation culture) stimulates trust and respect in employees, values collaboration and is illustrated by quick decision-making and search for solutions (Cassiolato et al., 2011). The relations described by institutional linkages among units/nodes are a key component of social network theory (Klerkx & Leeuwis, 2013). Diffusion study concentrates on circumstances that escalate or diminish probability that new idea, process or product will be up taken by constituents of a certain culture (Pijpers et al., 2008). By studying how innovation takes place using Diffusion of Innovation Theory, Kumar (2014) concludes that media and personal exchanges affect belief and judgment.

Innovation culture can be defined as a multi-faceted construct involving four pillars, namely: intent to innovate, infrastructure to back innovation, the norms vital to shape a market and value direction, and the foundation to undertake innovation (Dobni, 2008). Feinson (2013) on the other hand looks at an innovation culture as a multi-dimensional construct consisting of the goal to be innovative, the infrastructure to back innovation, operational level norms vital to sway a market and value alignment as well as the atmosphere to apply innovation.

Innovation culture can be affected by several factors such as strategy, structure, support mechanisms, behavior and open communication

(Cozzens & Kaplinsky, 2012). Majid (2011) posits that embedding a culture of innovation is key to ensuring a firm has necessary resources to innovate.

A nation's culture is a major component in advancing its innovative power. According to Dunphy and Herbig (2014), 30% to 50% of a society's innovative ability is affected by its national culture. Innovation and creativity are being fronted as basic drivers of productivity, wellbeing and economic advancement (Panfilo, 2010). Many scholars perceive the function of innovation as vital to the economic advancement (Kusiak, 2014; Panfilo, 2010). Lundvall et al. (2013) avers that innovation culture is key in economic development, enhancement of sustainable competitiveness and boosting the value of life.

Alemdar (2014) concurs that innovation gives important basis by which global economies participate in the international arena. While describing the value of innovation, Mulgan (2012) avers even further that "innovation-machine" is the centre of capitalism. For this study, innovation culture was operationalized through organizational learning, customer focus, empowerment and team orientation. This concurs with earlier work by Dobni (2008) who measured innovation culture using seven dimensions, namely: innovation propensity; organizational constituency, organizational learning; creativity and empowerment; market orientation; value orientation; and implementation context

Whereas it is agreed that an effective innovation system is required for a nation to strengthen the capability offered by modern science and technology, previous studies have explored the underpinning concepts, that is innovation system factors (Feinson, 2013; Fagerberg & Sapprasert, 2011;), incentives (Cassiolato & Lastres, 2011; Durongkaveroj, 2010), culture (House et al. 2012;) and institutional linkages (Cozzens & Kaplinsky, 2012; Bartels & Koria, 2012) separately. This study sought to determine any interrelationship that exists among the foregoing concepts and how the same translates into an effective NIS.

Objectives and Hypothesis

The study objective was to explore the influence of innovation culture on the relationship between NIS factors and institutional linkages in the NIS in Kenyan ICT innovation firms. This was tested by the hypothesis which was stated as **H_a:** Innovative culture has a significant intervening effect on the relationship between NIS factors and the institutional linkages in NIS.

Purpose of Study

The findings are set to help both researchers and scholars since it will increase their understanding of NIS and competitiveness, both at sectorial and national level. The study will also act as a foundation for future research. The learning institutions will benefit from this study as they will know their contribution to the NIS and any short falls in skills required in the ICT sector. This would also encourage these institutions to align their curriculum to the sectoral needs since universities are broadly recognized as vital institutional players in NIS as noted by Cozzens and Kaplinsky (2012). Further, universities undertake commercial activities such as selling knowledge and developing enterprises even as organizations assume intellectual approaches, distributing knowledge among themselves and learning at high level of skills. In modern "knowledge-based" economies and industrialized nations, universities provide "knowledge workers" and ensure flow of ideas via increased applied research undertakings (Abidin et al., 2012).

Literature Review

Important cultural norms can facilitate interactive learning in a regional innovation system. These norms include openness to learning, trust and cooperation between firms (Cooke and Morgan, 2013).Ney (2013) indicates the weakness of the national innovation systems account of culture, where the national differences from an empirical and theoretical perspective are not considered in the constructs of national innovation systems..

The innovation culture, of course, is likewise an expression of people, their past, and their current beliefs, ideas, and behaviors. They make innovation happen, and they do so consistently over time. Since the innovation culture is not all that common among today's organizations, we know that it's not so easy to create one. A key reason for this is that the characteristics needed to achieve an innovation culture are not seen as the some ones that are needed in successful companies. For example, it's only a slight exaggeration to say that companies love stability and predictability because these factors make it easier to earn profits;innovation, however, is

about adaptation and change, which can be very difficult to live with or to profit from.Companies seem to adore repetition because it suggests business scalability, but innovation is all about novelty and the unexpected.

By enhancing workplace social networks, collective knowledge establishes a foundation for promoting innovative behavior of employees as opposed to individualism. Making awareness of the existence of innovation can lead to uptake and the consequent transfer of knowledge between actors in an innovation system (Lundvall et al., 2010). Innovative culture can encourage innovative behavior among all employees of a firm by influencing the behavior patterns of employees, increasing their participation and making innovation be vital part of company policy (McDonald, 2011). In addition, there are several adhocracy cultures that promote innovation, namely: creativity (Cassiolato et al., 2011), empowerment (Durongkaveroj, 2010), freedom and autonomy (Fagerberg & Sapprasert, 2011), and risk- taking (Hoogendoorn et al., 2012).

Competitive advantage is gained by the nation that enhances an infrastructure of interconnectedness among organizations, universities and the government via faster information diffusion and deployment of innovation. Institutional linkages among various actors of a national innovation system is a major component in the competitiveness of a knowledge-based economy (McDonald, 2011). Infrastructure of communications in the form of diffused innovation is vital in strengthening the connectedness of NIS actors and streamlining the movement of knowledge and resources between actors (Koria et al., 2012). Research done by Koria et al. (2014) indicated that institutional linkages within actors as well as interaction among various factors that affect the national innovation system, determined the level of innovativeness in both Ghana and Kenya.

METHODOLOGY

A study design shows how the investigation was undertaken and solved (Orodho & Kombo, 2003). As guided by Cooper and Schindler's (2003) definition, this research adopted a descriptive survey design. According to Kothari (2004), a descriptive design involves the use of statistical methods in processing raw facts into information.

Target population of this study comprises all innovation-based institutions in Kenya including the Ministry of Information Communication Technology MoICT), Ministry of Education and Science and Technology (MoEST), universities, technology research institutions, innovation hubs, and ICT professional bodies, with the units of analysis being institutions in ICT NISThis study employed primary data. The data was collected using questionnaires as they are appropriate tools that can provide a high degree of data standardization and are cheap to administer (Kombo & Tromp, 2016). It is also convenient to collect data from a large population. The study used both quantitative and qualitative data on all the variables in the study. This was gathered by use of a semi-structured questionnaire with both closed and open-ended questions. Most of the items on the questionnaire were put up using a five-point Likert scale going from "not at all" (1) to a "very large extent" (5).

The questionnaire was designed to seek information on innovation culture that mediates on the relationship between NIS factors and NIS institutional linkages.

The respondents were Chief Information Officers, Chief Operations Officers, research and development managers and other key officials charged with managing innovations in the selected institutions. Drop and pick method as well as electronic mail was used to administer the questionnaires.

The moderation effect was tested using stepwise regression as suggested by Baron and Kenny (2010) where regression analyses are conducted and the significance of coefficients is tested at each step. The moderation model tests whether the prediction of a dependent variable, Y, from an independent variable, X, differs across levels of a third variable, Z (Baron &Kenny, 2010).

Moderator variables affect the strength and/or direction of the relation between a predictor and an outcome: enhancing, reducing or changing the influence of the predictor. Moderation effects are typically discussed as an interaction between factors or variables, where the effects of one variable depend on levels of the other variable in analysis. Moderation effects are tested with multiple regression analysis, where all predictor variables and their interaction term are centered prior to model estimation to improve interpretation of regression coefficients.

The moderating effect was tested as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where (β=Co-efficient, Y = NIS institutional linkages, α = intercept/constant, ε = error term, X_1 = NIS Factors, X_2=innovation culture).

The *p*-value approach involves determining "likely" or "unlikely" by determining the probability assuming the null hypothesis were true of observing a more extreme test statistic in the direction of the alternative hypothesis than the one observed. And, if the *p*-value is greater than *α*, then the null hypothesis is not rejected. The co-efficient of the models were used to make a decision on whether the independent variable has a significant influence on the institutional linkage variable as recommended by Conover (2009) and, Malhotra and Dash (2011).

The significance level for the study is that if the *p*-value<0.05, the hypothesized relationships are taken to be significant and this can lead to rejecting the null hypothesis.

RESULTS

Innovation Culture

The response in this variable was collected based on organizational learning, customer focus, employment and team orientation. The test for normality on this response was carried out and the results were displayed as shown in the table below:

Table4.1. *Normality Test for Innovation Culture Factors*

	Shapiro-Wilk		
Innovation Culture	**Statistics**	**Df**	**Sig.**
Organizational learning	.403	4	.520
Customer Focus	.287	4	.661
Employment	.242	4	.601
Team Orientation	.517	4	.425

From Table 4.1, based on the Shapiro-Wilk test, the significance value for all of the innovation cultures is not significant since p-value > 0.05 for Shapiro-Wilk tests. This indicates that the probabilities are greater than0.05 for inclusion of respondent in the sample size to enhance objectivity of data collection. Hence this means the data collected on this variable was normal.

Institutional Linkages

The response in this variable was collected based on joint research, personal exchanges, cross-patenting and purchase of equipment. The test for normality on this response was carried out and the results were displayed as shown in the table below:

Table 4.2. *Normality Test for NIS Institutional linkages*

	Shapiro-Wilk		
NIS Institutional linkages	**Statistics**	**df**	**Sig.**
Joint Research	.891	4	.520
Personal exchange	.754	4	.661
Cross-patenting	.143	4	.601
Purchase of Equipment	.612	4	.425

From Table 4.2, based on the Shapiro-Wilk tests, the significance value for all of the NIS institutional linkages is not significant since *p*-value > 0.05 for Shapiro-Wilk tests. This indicates that the probabilities are greater than 0.05 for inclusion of respondent in the sample size to enhance objectivity of data collection. Hence this means the data collected on this variable is normal.

The Influence of Innovation Culture on the Relationship Between NIS Factors and Institutional Linkages in the National Innovation System in Kenya

The influence of innovation culture intervening the relationship between NIS factors and institutional linkages in the National Innovation System in Kenya was determined using path analysis and followed four steps analysis as described below.

The first step was to find the influence of NIS factors on NIS institutional linkages. The second step was to determine the influence of NIS factors on innovation culture. The third step was to determine the influence of innovation culture on NIS institutional linkages and the fourth step was to determine the effect of NIS factors and innovation culture on NIS institutional linkages.

The direct and indirect effect in testing for the intervening effect was as presented in the path diagram below:

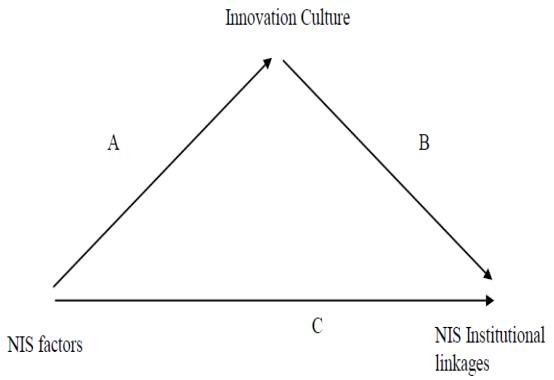

Figure 4.1. *Path diagram for intervening effect (Source: Author, 2018)*

Step one of the testing intervening effect of innovation culture on the relationship between NIS factors and NIS institutional linkages was performed. This step involved evaluating the influence of NIS factors on NIS institutional linkages. The results were as shown in table 4.3

Table 4.3. *Influence of NIS factors on NIS Institutional linkages*

Model summary					
Model	R	R^2	Adjusted R^2	Std.Error of estimates	
1	.591	.350	.341	.724	
ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	20.010	1	20.010	38.194	.000
Residual	37.197	71	.524		
Total	57.207	72			
Co-efficients					
	Unstandardized co-efficients		Standardized co-efficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.599	.463		1.295	.200
NIS factors	.806	.130	.591	6.180	.000

- *Dependent Variable: Nis Institutional linkages,*
- *Predictors: (Constant), National Innovation System (NIS)factors*

From Table 4.3 indicates that the influence of NIS factors and NIS institutional linkages had a positive significant effect (B=0.806,p<0.05). This indicates that an increase in NIS factors increases NIS institutional linkages. R=0.591, which indicates that there exists a strong positive relationship between NIS factors on NIS institutional linkages. Using adjusted R^2 =0.341, the model can show up to 34.1% of variation when estimating the relationship between NIS factors on NIS institutional linkages to the larger population in general. The results confirmed the first step of testing for intervening effect of innovation culture on the relationship between NIS factors and NIS institutional linkages since it was significant.

The second step for testing the intervening effect of innovation culture on the relationship between NIS factors and NIS institutional linkages involved testing the influence of NIS factors on innovation culture. The results were shown in table 4.4 below

Table 4.4. *Influence of NIS Factors on Innovation Culture*

Model Summary					
Model	R	R^2	Adjusted R^2	Std.Error of estimates	
1	.628	.394	.386	.864	
ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	34.475	1	34.475	46.175	.000
Residual	53.010	71	.747		
Total	87.484	72			
Co-efficients					
	Unstandardiesed co-efficients		Standardiesed co-efficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.035	.552		-.063	.950
NIS factors	1.058	.156	0.628	6.795	.000

- *Dependent Variable: Innovation culture*
- *Predictors: (Constant), National Innovation System (NIS)factors*

From Table 4.4 indicates that the influence of NIS factors and innovation culture had a positive significant effect (B=1.058,p<0.05). This indicates that an increase in NIS factors increases innovation culture. R=0.628, which indicates that there exists a strong positive relationship between NIS factors on NIS institutional linkages. Using adjusted R^2 =0.386, the model can show up to 38.6% of variation when estimating the relationship between NIS factors on innovation culture to the larger population in general. The results confirmed the

second step of testing for intervening effect of innovation culture on the relationship between NIS factors and NIS institutional linkages since it was significant.

The third step for testing the intervening effect of innovation culture on the relationship between NIS factors and NIS institutional linkages involved testing the influence of innovation culture on Nis institutional linkages. The results were shown in table 4.5 below

Table 4.5. *Influence of innovation culture on NIS institutional linkages*

Model summary					
Model	R	R^2	Adjusted R^2	Std.Error of estimates	
1	.307	.094	.081	.854	
ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	5.389	1	5.389	7.384	.008
Residual	51.818	71	.730		
Total	57.207	72			
Co-efficients					
	Unstandardized co-efficients		Standardized co-efficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.503	0.348		.000	2.503
Innovation culture	.248	.019	2.717	.008	.248

- *Dependent Variable: NIS Institutional linkages*
- *Predictors: (Constant), Innovation culture*

From Table 4.5 indicates that the influence of innovation culture on NIS institutional linkages had a positive significant effect (B=0.248, $p<0.05$). R=0.307, which indicates that there exists a weak positive relationship between innovation culture on NIS institutional linkages. Using adjusted R^2 =0.094, the model can show up to 9.4% of variation when estimating the relationship between innovation culture and NIS institutional linkages to the larger population in general. The results confirmed the third step of testing for intervening effect of innovation culture on the relationship between NIS factors and NIS institutional linkages since it was significant.

The fourth step for testing the intervening effect of innovation culture on the relationship between NIS factors and NIS institutional linkages involved testing the influence of innovation culture and NIS factors on NIS institutional linkages. The results were shown in Table 4.6 below:

Table 4.6. *Influence of Innovation Culture on NIS Institutional linkages*

Model summary					
Model	R	R^2	Adjusted R^2	Std.Error of estimates	
1	.676	.458	.426	.676	
ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	22.019	4	5.505	10.638	.008
Residual	35.188	68	.517		
Total	57.207	72			
Co-efficients					
	Unstandardized co-efficients		Standardized co-efficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.220	1.179		-1.035	0.304
NIS factors	1.342	.314	0.23	4.278	.030
Innovation culture	-0.160	0.096	0.008	-1.671	0.009

a. *Dependent Variable: Nis Institutional linkages*

b. *Predictors: (Constant),NIS factors, Innovation culture*

From Table 4.6 indicates that the influence of NIS factors on NIS institutional linkages had a positive significant effect (B=1.342,$p<0.05$) and innovation culture on NIS institutional linkages

(B=-0.160,p<0.05). R=0.676, which indicates that there exists a strong positive relationship between innovation culture and NIS factors on NIS institutional linkages. Using adjusted R^2 =0.426, the model can show up to 42.6% of variation when estimating the relationship between innovation culture, NIS factors on NIS institutional linkages to the larger population in general. The results confirmed the fourth step of testing for intervening effect of innovation culture on the relationship between NIS factors and NIS institutional linkages since it was significant. Hence this result supports that innovation culture has an intervening effect on the relationship between NIS factors and NIS institutional linkages. The study therefore rejects the null hypothesis.

The outcome was indicative that the NIS factors intervened by innovation culture influences the NIS institutional linkages of Kenyan ICT institutions.

Since the p-value<0.05 for the ANOVA table using F-test, hence this result leads to rejecting the null hypotheses $\mathbf{H_{0a}}$: Innovative culture has no significant intervening effect on the relationship between NIS factors and the institutional linkages in NIS. The influence of these relationship was studied using a stepwise multiple linear regression equation. It was established that innovation culture has an intervening effect on the relationship of NIS factors and institutional linkages in the NIS in Kenyan ICT institutions. The results yield equation shown below:

Y= -1.22 + 1.3427*NIS factors - 0.160* Innovation culture

The equation indicates that the introduction of innovation culture after the effect of NIS factors on NIS institutional linkages changes to negative leading to innovation culture giving a negative effect on NIS institutional linkages. This implies that given NIS factors that have positive influence on NIS institutional linkages, the introduction of diverse cultures might reduce the influence of NIS factors on the strength of NIS institutional linkages.

Conclusion and Recommendation

Further, the study established that innovation culture has a significant intervening effect on the relationship between NIS factors and institutional linkages of NIS in Kenya ICT innovation institutions. This hence indicated that when innovation culture is enhanced, then the relationship between the NIS factors and institutional linkages in NIS is strengthened. This led to rejection of the null hypothesis ($\mathbf{H_{0a}}$)and concluded that innovation culture has significant intervening effect on the relationship between NIS factors and the institutional linkages in NIS. From the study findings it is recommended to have the right innovation culture which is ideal for specific institution within NIS to induce and foster innovation across and amongst the innovation institutions.

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Reference

[1] Alemdar, M. (2014). *A Monte Carlo Study: The Impact of Missing Data in Cross-Classification Random Effects*

[2] *Models.* (Doctor of Philosophy), Georgia State University, Atlanta, GA. (3401593).

[3] Altenburg, T. (2013). Building Inclusive Innovation Systems in Developing Countries: Challenges for IS Research. In B.-A. Lundvall, K. J. Joseph, C. Chaminade & J. Vang (Eds.), *Handbook of Innovation Systems and Developing Countries*: Edward Elgar Publishing.

[4] Battu H. and Y. Zenou (2010). Oppositional Identities and Employment for Ethnic Minorities: Evidence from England. *Economic Journal* , 120(542), F52 - F71, 02.

[5] Becker, H. S. (1963), Outsiders: Studies in the Sociology of Deuiance. New York: The Free Press.

[6] Cassiolato, J. E., & Lastres, H. M. M. (2011). Science, Technology and Innovation Policies in the BRICS Countries: An Introduction. In B.-A. Lundvall (Ed.), *BRICS and Development Alternatives: Innovation Systems and Policies*. New York: Anthem Press.

[7] Cozzens, S., & Kaplinsky, R. (2012). Innovation, poverty and inequality: cause, coincidence, or co-evolution? In B.-A. Lundvall, K.J. Joseph, C. Chaminade & J. Vang (Eds.), *Handbook of Innovation Systems and Developing Countries* (pp. 303): Edward Elgar Publishing.

[8] Delgado, M.,Michael, E. & Scott, S. (2011). Cl usters, Convergence, and Economic Performan ce, Census Working Paper available at www.isc .hbs.edu

[9] Dobni, C. (2008), "Measuring innovation culture in organizations", European Journal of Innovation Management, Vol. 11 No. 4, pp. 539-559.

[10] Durongkaveroj, P. (2010). *Science technology and innovation: Policy and management* [PowerPoint slides]. Retrieved from http:// www.picmet.org/new/Conferences/2010 /pichet.pdf

[11] Fagerberg, J., & Sapprasert, K. (2011). National innovation systems: the emergence of a new approach. *Science and Public Policy*, *38*(9), 669-679.

[12] Feinson, S. (2013). National Innovation Systems Overview and Country Cases. In P. Center for Science, and Outcomes (Ed.), *Knowledge Flows, Innovation, and Learning in Developing Countries* (Vol. 1, pp. 13-38): Global Inclusion Program of the Rockefeller Foundation.

[13] Giddens, A. (1984). The constitution of society. Outline of the theory of structuration. Cambridge: Polity press.

[14] Giddens, A. (2004). The constitution of society. Outline of the Theory of Structuration. Cambridge:

[15] Gigler, B. (2011). Informational Capabilities - The missing link for the impact of ICT on development: E-Transform Knowledge Platform Working Paper. The World Bank, Working Paper Series No. 1. Groupware and teamwork.(pp. 1 – 19). Edited by Ciborra, C.U. Chichester: John Wiley & Sons.

[16] Hanseth, O. & Monteiro, E. (2007). *Inscribing behavior in information infrastructure standards.*

[17] Harper, G.R., & Utley, D.R. (2001). Organisational culture and successful information technology implementation. *Engineering Management Journa*l, *13*(2): 11-15.

[18] Herbig, P. & Dunphy, S. (2008). Culture and innovation, cross cultural management: Hoffman, N., & Klepper, R. (2000). Assimilating new technologies: The role of organisational culture. *Information Systems Management*, 17(3): 36-42.

[19] Jongerling, R. (2006). *A process model for work-flow management in construction*. PhD thesis.

[20] Juma, N. M. (2006). The Virtual University: Models and Messages, Lessons from Case Studies. "United Nations Educational, Scientific and Cultural Organization", *International Institute for Educational Planning*

[21] Klerkx, L., & Leeuwis, C. (2013). Establishing and Embedding Innovation Brokers at Different Innovation System Levels: Insights from the Dutch Agricultural Sector. *Technological Forecasting and Social Change*,76, 849–860

[22] Kling, R. (2000). Social Analyses of Computing: Theoretical perspectives in recent empirical research. *ACM Computing Surveys*, 12(1),61-110.

[23] Leyden, D. P., & Link, A. N. (2015). Public sector entrepreneurship: US technology and innovation policy. New York: Oxford University Press

[24] Mapila, M., Kirsten, J. F. & Meyer, F. H. (2011). The Impact of Agricultural Innovation Systems Interventions on Rural Livelihood Outcomes. *Development Southern Africa* (March–June).

[25] Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). The Open Book of Social Innovation *Social innovator series: ways to design, develop and grow social innovation*: The Young Foundation.

[26] Nepelski, D., & Piroli, G. (2016). Organizational diversity and innovation potential of EU funded research projects.

[27] Nepelski, D., Piroli, G., & De Prato, G. (2016). European start-up hotspots: An analysis based on VC-backed companies. Seville: JRC-IPTS

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