Attributes of Open Innovation ICT Forums

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ABSTRACT

Purpose – The growth and profitability of the ICT industry is dependent chiefly on innovation in digital services. As Open Innovation is gaining force, a number of Open Innovation based forums, which cater to Digital Services and the ICT industry, have sprung up in recent years. This paper analyzes the characteristics of these forums, in the form of factors extracted from a number of Open Innovation and other parameters, and presents the findings. Forums from across the globe were sampled for the analysis.

Findings– From the literature, about 11 parameters were identified and used to rate the forums. Factor Analysis with Principal Components was conducted for the global sample of Open Innovation ICT consortia. The Open Innovation forums for ICT/Digital Services are found to have three characteristics represented by the three factors – the intensity of Open Innovation practice in the forum, how global is the forum, and how established is the forum.

JEL Classification: O31, O32, L96

Keywords- Open Innovation, Digital Services, Forums, Consortium, Strategy, ICT, Telecommunications, Telecom, Telco, Mobile Data Services, MDS, Value Added Services, VAS

1. Open Innovation and the ICT Industry

Innovation has been recognized as one of the key growth and profitability drivers for firms (Christensen, 2003, 2013, Drucker, 1988). In Open Innovation, firms adopt external ideas in their innovation process, while exposing their own ideas to be exploited by other organizations (Chesbrough, 2003, 2006, 2011). The ICT (Information Communication Technology) industry, which was earlier known as the Telecommunications Industry, has adopted Open Innovation successfully for survival and growth (Bigliardi et al, 2012 and Bouwman, 2008 and Nesse, 2009) in this new era of competition, de-regulation, changed technology landscape (e.g. wide-spread use of Internet Protocol, mobile technology, smartphones, etc.) and evolving business models. To successfully launch more innovative and profitable services, ICT firms are collaborating in several ways, both formally and informally, with Mobile Digital Services/Value Added Services providers, Research & Development labs, academic institutions, equipment vendors, government organizations, and are even partnering with other ICT firms. Globally, several Open Innovation forums and consortia are being setup in the industry to improve the digital services landscape. There are very few studies on these ICT forums as against studies on companies. This is the case even when some of the forums are run by individual companies. It is essential to study the attributes of these forums from an innovation standpoint. As these consortia are open innovation forums, the literature on Open Innovation has been studied to examine which parameters are applicable to these forums. It is then determined as to how the characteristics fall into major categories or factors.

2. The Digital Services Landscape

The past five years have witnessed a steep rise in the number of ICT related Open Innovation forums, hubs, and consortia. Many of these lie outside the boundaries of the Telcos. Hence genuine Open Innovation in the free marketplace is a strong and growing reality, and is a real boost to the existing or upcoming VAS/Mobile Digital Services ecosystem, which in turn helps the Telco/ICT industry (Nesse, 2009; Bigliardi et al., 2012; Al-Debei, 2010, 2013). This paper is an empirical study of the attributes of the Open Innovation ICT collaborations pertaining to the current landscape of digital services. The characteristics of the different forums for ICT which describe the kind of collaborations formed from the point of view of how they engage in open innovation are all examined. The studied characteristics have been derived from the Open Innovation literature (Duarte and Sarkar, 2011; Dahlander and Gann, 2011). For the purposes of this study, the terms alliance, forum, and consortium have been used interchangeably. The triple helix model of innovation (Etzkowitz, 1994; 1998; 2003; Payumo et al., 2012) focuses on collaborations between government, universities, and the industry. However, a fourth helix has been added to the triple-helix in terms of co-creating with the end-users, or the public (Leydesdorff, 2003). Open Innovation alliances being formed in the current industry tend to include all four of them. The alliances may start out with two or three of the four, and later include the fourth. Typically, co-creation with public tends to be the last one to be added, because the model and platform need to be in place to allow the public/end-users to contribute effectively.

3. Open Innovation Forums for ICT

A sample of about 40 Open Innovation ICT Forums globally were studied and analyzed. To avoid sampling bias, the following steps were taken:

- Consortia were chosen from different geographies – North America, South America, Africa, Europe, and Asia.
- Different sizes of forums were chosen – ranging from those collaborations driven by governments, or large corporations, to those that focused on innovations from startups and academia or even smaller groups for training individuals and preparing/funding entrepreneurs.
- Different types of forums/consortia were selected – Commercial, non-commercial, research, non-research, collaborations with academic, educational and R & D institutes and laboratories, venture capital raising forums for startups, forums for ideation contests, open-source groups, training forums, etc.
- Both Telco and non-Telco participating forums were chosen. The rationale is that many VAS/MDS companies specialize in areas that are not necessarily in the Telco's remit of expertise. Eventually they may collaborate with a Telco in a different way (other than investment), i.e. help take their services to the end-customers or to other enterprises. But in this study it's essential to study how these collaborations are improving the digital services landscape, regardless of whether the Telcos are helping them start or fund these initiatives/collaborations. For example a VAS startup company specializing on e-Health need not have a Telco funding it, or having a partnership in the company, but the company is likely to collaborate with the Telco for launching its services (which is more downstream in the company's process).

The data was collected in January 2015.

Some examples from the sample are given below:

Table 1: Examples of Open Innovation ICT Forums

S. No.	Geographic Region	Open Innovation ICT Forums
1	North America	Cisco EIR (USA), iCluster (Mexico), AT&T Foundry (USA), TR Labs (Canada)
2	South America	Telefonica Innovation Hub (Brazil), STI (Chile), wenovate (Brazil)
3	Africa	MEST (Ghana), IceAddis (Ethiopia), iHub (Kenya), ActivSpaces (Cameroon)
4	Europe	Open Living Labs, Lindholmen Park (Sweden), Fing (France), Adastral Park (UK)
5	Asia	Init (India), THTI (China), Telecentre Network, FOSS4G (Thailand)

4. Studying Characteristics of the ICT Forums

Each of the Open Innovation Forums described in the earlier section was rated on 15 different parameters as given below:

Table 2: Attributes of the Open Innovation ICT Forums

S.NO.	PARAMETER	DESCRIPTION
1	ORGANIZATION	Name of the consortium
2	Region	Geographic Region, usually continent, i.e. Asia, Africa, Europe, North America, South America.
3	Country	The country to which the consortium/forum belongs
4	BENEFITS - Inbound-Outbound	Inbound to Outbound. Rated on a scale of 1-5, i.e. 1 (Lowest) to 5 (Highest). This describes whether the benefits are more inbound (i.e. receiving ideas), or more outbound (sharing out). (Elmquist, 2009) (Dahlander et al., 2010)
5	BENEFITS - Pecuniary	Relates to whether business or monetary gains are a part of the goals. Rated on a scale of 1-5. (Dahlander et al., 2010)
6	BENEFITS - DIRECTNESS OF USE (1-3)	The three levels are: Symbolic (Lowest), Conceptual (Medium), and Instrumental (Highest). They indicate how directly the market can benefit from the

		innovation, i.e. whether it is an idea (symbolic), or a well-defined framework, or a full implementation (instrumental).
7	LOCUS OF COLLABORATION (1-5)	This ranges from Internal (lowest) to External (highest), in a reference from whether the collaboration is between internal divisions (or subsidiaries) of an organization or whether it extends to many parties outside the organization.
8	NO. OF COUNTRIES	The number of countries the collaboration extends to
9	NO. OF ORGS INVOLVED	The key number of strategic players in the collaboration
10	NO. OF LABS	An indication of the research involved
11	SIZE OF COLLABORATORS	Graded from Very Low- Very High (1-5), where a startup company would be rated as Very Low, and a giant corporation or government would be very high (Elmquist, 2009)
12	TARGET (INCREMENTAL-RADICAL)	About target innovation – ranging from Incremental Innovation to Radical Innovation on a scale of 1-5. Pelz (1978)
13	ROLE OF COMPANY (1-4)	From merely Investor (L), to Facilitator, Idea Generator, Developer of Platform (H) (on a scale of 1-4)
14	ORG STR (1-4)	Rigid Teams (Low), Task Forces, Federated, Mass Collaboration (High) (on a scale of 1-4)
15	TYPE OF COLLAB (WEAK-STRONG)	From Weak Ties (Low) to Strong Collaborations (High) (on a scale of 1-5)
16	METHOD OF INNOVATION (1-3)	Lead User Method, Ideation Contest, Mass Collaboration (on a scale of 1-3) (Erkens, et al., 2013)
17	MEASUREMENT TYPE (1-4)	How the innovation is measured: Input (Low), Process, Output, Outcome (High) (on a scale of 1-4). (Erkens, et al., 2013)

Factor Analysis with Principal Components was carried out on the resulting data pertaining to 41 Open Innovation ICT forums. The results of the Factor Analysis were as follows:
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The following 4 variables, from the list above, were progressively removed as they exhibited a high degree of cross-loading among the factors:

- Size of the collaborators
- Method of Innovation
- Locus of Collaboration
- Benefits – Inbound/Outbound

Finally, the principal components from the factor analysis on 11 variables yielded the following three factors:

- Open Innovation Intensity in the collaboration – with high loading of the eight variables (as given in the table below)
- Global footprint of the collaboration – with high loading of the two variables: number of countries, and number of labs
- How established is the collaboration - with high loading of the two variables: number of organizations in the forum, and the age of the forum

Table 3: Factor Analysis of Open Innovation Variables - KMO & Bartletts's Tests

Sample Characteristics	Value
Sample Size	41
KMO > 0.5	Yes (0.785)
Bartlett's Test of Sphericity - Significance (p value < 0.05)	Yes (0.000)

The factorability of the 11 variables was examined using Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The sample was found to be suitable for conducting factor analysis with principal components.

The Rotated Component Matrix is as follows:

Table 4: Rotated Component Matrix

Variable	Component		
	OI Intensity	Global Footprint	How Established
ROLE OF COMPANY	.909		
MEASUREMENT TYPE	.894	.305	
TYPE OF COLLABORATION	.864		
BENEFITS: PECUNIARY	.859		
BENEFITS: DIRECTNESS OF USE	.855		
TARGET INCREMENTAL/ RADICAL	.806		
ORGANIZATION	.661	.364	

STRUCTURE			
NO. OF LABS		.869	.289
NO. OF COUNTRIES		.804	
NO OF ORGS INVOLVED		.295	.781
YEARS OF AGE OF COLLABORATION			.775

The cumulative explained variance of the three extracted factors is 75%. This is for the rotation sums of the squared loadings. This was considered acceptable as the loss in information is restricted to about 25%.

Examining the four excluded variables which exhibited high cross-loading on the three factors:

- Locus of Collaboration: This value of this variable determines whether or not the collaboration is internal (within an organization), to collaboration externally (with other organizations). This would correlate well with the first factor, Open Innovation intensity, because the very definition of Open Innovation is collaboration with external actors. Also as the forum gets well established, and expands globally, its Locus of Collaboration also may shifts towards outside, especially because it is a forum, not a company.
- Benefits (Inbound/Outbound) and Method of Innovation – The above reasoning holds for these two variables too
- Size of Collaborators – As the size of the collaborators increases, it is indicative of the fact that the size and power of the players engaging in open innovation practices are increasing (hence consequently the open innovation practices themselves, because the purpose of the forums is to engage in Open Innovation), but also that the forum is becoming more global and established.

5. Conclusions

Open Innovation in ICT is picking up strongly. As is evident from the study, organizations of a wide variety and background are investing, participating or benefitting from the ICT forums. Not only organizations but individuals and entrepreneurs are drawing immense value from these ICT Open Innovation alliances. The findings of the study in this paper are as follows:
There were 15 Open Innovation parameters identified, which comprehensively cover the characteristics of the different ICT forums chosen. Of these 11 were found to be adequately suitable for factor analysis with principal components and the resultant three factors were found to be enough to explain the bulk of the variance. The three factors depict three prominent characteristics of an Open Innovation ICT consortium - Open Innovation intensity of practice, Global footprint and how Established is the forum. Together they also reveal the direction that the forums should take:

(a) Intensify Open Innovation in terms of the following six parameters:

a. Role of the company: Moving from mere investor & facilitator to incubator and actually implementing, developing and launching concrete platforms for collaboration.

b. Measurement Type: Moving from merely measuring inputs for innovation to measuring the outcome in terms of financial, growth and social impact.

c. Type of Collaboration: Moving from mere agreements to solid partnerships with financial stake and well measured business, R&D and other KPIs (Key Performance Indicators).

d. Benefits – Pecuniary: Moving from mere R&D or development models and goals to business models with return on Investment and growth.

e. Benefits – Directness of Use: Moving from mere idea generation to actual implementation and deployment of ideas

f. Innovation Target (Incremental/Radical): Moving from incremental/evolutionary innovations to revolutionary/radical innovation also (covering the entire spectrum)

g. Organization Structure: Moving from well defined, rigid innovation teams towards mass collaboration, crowd-sourcing models. The final organization structure will be able to handle the full range of innovations – from closed innovation to mass collaboration.

(b) Increase Global Footprint: Build global collaborations and R & D centers/labs to improve the richness and variety of ideas, improve global opportunities and de-risk the models being built. Many models may have been tested under different circumstances e.g. different geography, cultures, regulations, economic conditions, etc. These may yield deep insights over the years.

(c) Become Established: Not only in terms of years and improving reputation, but also increasing the number of partnerships and collaborating organizations.

By adopting the above steps, the ICT forums can sharpen their innovation edge and accelerate the process of innovation.

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