Report on LIRNE*asia* as a model virtual organization (VO) using ICTs for management of own and other research and for capacity building

Executive Summary

LIRNE*asia*'s research project on Virtual Organisation (VO) had two aspects; developing the VO and using it to conduct LIRNE*asia*'s other research projects. This case study describes our efforts, outcome and lessons learnt. It is intended for any research/civil society (or even private sector or government) organisation, with limited staff that plans to work from geographically distant locations. It is also for project based organisations with limited overhead budgets.

The report identifies different models and characteristics of VO. A key characteristic most authors identify is the use of ICTs as a foundation. However, the opinions vary. Some see VO more as a temporary solution to link few entities working together on a particular project, while others see it as a web based operation like eBay and Amazon.com, with a skeleton backend staff.

A comparison is made to map LIRNE*asia* into these structures. A key observation is while the unique LIRNE*asia* model shows some overlap in characteristics such as flexibility, responsiveness, improved quality of work and cost reduction, it does not perfectly fit into any definition described, largely because LIRNE*asia*'s model emerges from necessity rather than building a VO for the sake of it.

Analysis of the usage LIRNE*asia*'s web portal, a key component of its VO structure shows a linear increase and substantial use by 'quality users'. Summary of technical features too are provide for the use of those who want to emulate.

The key lessons of the case study are that VOs are realistic, similar small sized organisations can benefit VO model if the decisions are made on necessities and VO mostly means a reduction in information systems expenditure, rather than an increase.

Index

1. Introduction

The concept of Virtual Organization (VO) is relatively young and the literature dates back to the early 1990's. However the literature available on the subject is prolific. The possible reason may be the interested come from different disciplines, including Information and Communication Technology (ICT), Business Administration, Management and Economics.

1.1. Why a Virtual Organisation?

Organization characteristics and structure are primarily decided by business needs. An organisation experiments with the available models and tools until it finds a structure it is most comfortable with. With the rapid development of the Information and Communication technologies (ICT), since early 1980s, more and more organisations seriously position themselves to get the maximum out of ICT, and few go the extra mile to be VOs to different degrees.

One major reason for going virtual is the increased competitiveness of the business environment and economy. "In order to survive and develop, many organisations have become faster, leaner, more customer-oriented and more conscious of cost than they have ever been before. As a result, many organisations have become virtual and going virtual is currently one of the key elements that increase business competitiveness" (Shao, Liao & Wang, 1998).

Another reason is the existence of geographical boundaries. Some organisation either work beyond national boundaries or at different locations within countries with larger geographical sizes. This results in a high dependency on ICTs. Such organisations will find VO model increasingly attractive, and perhaps the only one within which they could effectively operate.

A third motive may be cost effectiveness. Increasing transport and human resource costs makes face to face contact less attractive unless they are essential. Virtual relationships, in

spite of other issues, ensure substantially lower operational costs. Together, these make attractive reasons for organisations to follow VO model.

1.2. Structures of VO

Marshal, Mckay & Burn identify three possible structures for VOs; namely,
a)   An electronic or on-line organization such as Amazon or e-bay,
b)   An organization built on collaborating entities that come together for the purpose of working to a common goal and
c)   An amalgamation of the two.

They also describe four different models of VO.
a)   Co-alliance model, where several organizations come together to work on project by project basis
b)   Star alliance model which consists of a core dominant organisation and other satellite organizations or individuals
c)   Value alliance model where interrelated products, facilities and services of a supply chain are brought together and
d)   Market Alliance Model, which may consist of a several value alliance models and will include the coordination with regards to manufacture, marketing, distribution and selling.

Shao, Liao & Wang, (1998) have chosen to explain VO through four key factors, the degree of variability of which decides its structure. They are connectivity, purpose, technology and boundary. Taken together, the four key characteristics give guidance for the assessment of VO stability and for the design of new VOs. This also emphasises that degree of technical innovativeness is not the only factor that decides the structure of a VO.

Some publications use the terms virtual organisation and virtual team interchangeably (Jarvenpaa, & Leidner, 1999). However, there are instances a virtual team is defined as one typology of VO. The other typologies are; virtual team, virtual project, temporary VO and permanent VO (Okkonen, 2002).

Metselaar & van Dael recognise four types of VO structures. These are

a) Internal VO,
b) Stable VO
c) Dynamic VO and
d) Web enterprise or agile organisation.

Internal VO refers to a single organisation going virtual. The changes in communication are inter-departmental. Stable VO refers to outsourcing of non-core business activities. The Dynamic VO is an entity that cooperates largely with other organisations. Finally, a web enterprise or agile organisation refers to the online organisation. These are referred to as organisations that offer services or products in the world wide market. The authors consider this the purest form of virtual organization.

Thus we are far from agreeing on a universal structure for VO. This need not prevent any aspiring organisation adopting features that it would find best fit depending upon its unique requirements.

1.3. Characteristics of VO

The multiple definitions lead to different characteristics of VO being identified or given prominence over others. Bosch-Sijtsema (2004) identifies the lack of a physical location, the constant variability of its workforce, the extensive use of electronic means to communicate across national and regional boarders and the capability to bring together specialities of a number of organisations or individuals under one umbrella as characteristics of a VO.

According to DeSanctis & Monge, 1999 a VO is characterised by 'highly dynamic process, contractual relationships, edgeless permeable boundaries and reconfigurable structures'.

While highlighting the less administrative bottlenecks that are common in traditional organisations Marshal, Mckay & Burn point out the ability of VOs "to forge new organizational capabilities and competencies, thus averting the need to recruit, train and

forge new work teams, buy new equipment and buildings and work through a period of organizational learning". They also stress the importance of business alliances for the success of VO. Flexibility is also noted as a reason for the increased efficiency in the VO in some other publications (Rahman & Battachryya, 2000).

This concept is further echoed by Mowshowitz: "Promising greater flexibility and responsiveness, VO can be used to improve resource utilization, achieve better quality products and services, strengthen managerial control, and lower costs. These potential advantages derive from two main sources: systemic use of switching as a management principle and explicit formulation of goals" (Mowshowitz, 1997).

Use of electronic means of communication is a key characteristic of VO. According to Ahuja and Carley (1999) VOs should practice informal communication to compensate the absence of formal procedures, rules and hierarchy among employees. DeSanctis & Monge (1999) claim that the degree of productive communication should be higher in VOs in comparison to the traditional organisations. The increase in communication within a VO can be directly linked to the geographical dispersion of the organisation.

The lack of physical location and the ease in which new work teams are formed and disbanded has also led to some VO organisations often being classed as being temporary. (Mowshowitz, 1997b). This has also led to the characterisation of the VO as being opportunistic.

Most of the publications invariably claimed VO to be more efficient and flexible than a traditional organisation. This increased efficiency made them provided them the competitive edge in the market.

Nonetheless some literature identified the negative impacts of the concept too. According to Jarvenpaa, & Leidner (1999) the drawbacks of VO are as low individual commitments, role overload and role ambiguity. This may result in clients of VO feeling a reduced degree of permanency, consistency and reliability within the organisation and. can only be overcome

by building trust among the members or employees. This may take time and efforts because the individuals might not have physically met.

2. Where does LIRNE*asia* stand?

The VO model within which LIRNE*asia* operates on is unique a combination of some of the categories mentioned above. As a regional think tank, doing research in Asia Pacific, our work requires that we work with researchers who are locally based in the countries in which the research is being conducted. A high degree of communication not only between LIRNE*asia* and researchers but also among themselves is essential for developing quality produce within strict deadlines. This makes us more a Virtual Team, as defined above, than a VO but this is a subjective classification. Not being a private entity, the need to be competitive applies to LIRNE*asia* in a different sense.

Thus the key reasons that makes us a VO is necessity arises from
   a)   Geographical distance and
   b)   Cost effectiveness - We are a project based organisation and lean operation is fundamental to our work.
.

 LIRNE*asia* has some similarities with VOs as identified by Marshal, Mckay & Burn, such as Amazon and eBay, the most significant being the importance of our web portal. Just like them, we LIRNE*asia* too have a lean backend operation that provides maintains the web portal, but we practice other modes of dissemination too. Further LIRNE*asia* site focuses on a smaller niche.

Instead of strictly fitting into any one type of VO structures suggested by Metselaar & van Dael, LIRNE*asia* shows features of all four.

Flexibility, responsiveness, improved resource utilization and cost effectiveness, seen by some authors are evident in the model we practice – but to different degrees. We do not practice the VO model for the sake of it and still benefit from some traditional characteristics. The best example is our physical office located in Colombo. We find the

nexus of the two brings us better results. LIRNE*asia* also does not make any effort to use or experiment with the sophisticated technologies or information tools for the sake of doing that. Everything emerges from the necessity, rather than market trends.

LIRNE*asia* fits into the structure described by Marshal Mckay & Burn as an organisation where entities come together with the purpose of collaborating in order to achieve a common goal, but these entities are individuals in most cases. It takes the form of the star alliance model described in the same paper, with one central organisation and other satellite organisations/individuals. The dynamic VO mentioned in Metselaar & van Dael, 1999, also helps identify LIRNE*asia*'s activities as an organisation that collaborates largely with other entities. However, the collaboration is more a long term one, as opposed to the ideas of some authors.

Since its inception LIRNE*asia* has been a learning organisation and that implies this VO model too is dynamic and may further evolve with the future needs. It might not be a perfect fit for any other organisations but at least some lessons will be applicable.

3. Role of a web portal in a VO

Web portal is the key electronic interface window that opens any organisation to the outside world. In a VO, it is expected to play a more crucial role. When face to face interaction is minimal, web portal can be *the* organization for some of its stakeholders or even employees. It can be an effective tool for not only keeping remote staff updated on day to day activities but receiving their input for the ongoing work.

LIRNE*asia* web portal, www.lirneasia.net, has been designed and operated with these multiple objectives in mind. Most tools used in its design were freebies, though not necessarily open source. Wordpress blog interface was used as the front-end while facilities offered by flickr.com and youtube.com used to upload images and videos. Coding was kept at minimal. Technological sophistication was kept purposely low and the content and interactivity were given more weight.

Statcounter, (www.stantcounter.com), and Google Analytics, (www.google.com/analytics), were used to monitor and analyse traffic.

3.1. Features

These are the key technical features of LIRNE*asia* site.

o   Security and Stability

Though run with a Wordpress front-end, content is stored in a server space purchased by LIRNE*asia*. Therefore, LIRNE*asia* officially owns the content. Askimet Spam Protection is used to block spam. Automatic alerts are activated for downtime and 404 missing page errors.

o   Theme and User Experience

The theme was updated to meet Web Standards and provide smooth user interactivity and speed. The design priorities were a clean, efficient layout that loads fast on a variety of connections and gives prominence to the content within. The site can be viewed by almost all of the widely used browsers[1].

Following features were introduced in the recent revamp of the site.

- Web Standards – the theme was tested and modified to meet current XHTML and CSS standards
- Mobile Access – plugins were installed and configured to serve a different, lighter version of the site to mobile devices.
- Navigation – previous static page menus were converted to interactive drop-downs (using the Suckerfish method and plugin)

---

[1] Tested with different versions of five mostly used browsers. In few rare cases, the display was not perfect, but still readable.

- Search – search facility was reconfigured using AJAX so that search results emerge instantly.
- Commenting – commenting was enhanced with user icons (gravatars), instant updating (AJAX) and user-editing of their own comments.

  o Document Management

The scalable document management integrated to the system enables easy uploading of documents by staff, user friendly retrieval by visitors and search. Next step would be to introduce collaborative editing.

  o Collaborative Features

The site facilitates internal communications. This takes the form of shared calendars, documents, announcements, etc. The integration here is seamless. Additions introduced in the current revamp are:
- Document Sharing –Google Apps enables collaborative work on documents.
- Announcements – The current announcements plugin will be replaced with a user friendly application
- Twitter functionality – The Prologue theme enables easy entry of short posts to the website itself, grouped by user. Once logged in an entry form appears on the homepage itself, encouraging users to post.

3.2. Maintenance

LIRNE*asia* has no web-master and it has no plans to employ one in future. Every staff member, including remote users was trained to carry out the tasks of the web master. They make posts, upload project documents, photographs etc and also ensure smooth flow of comments.[2]

Project information dissemination is done in two ways. While ongoing project details are presented in the static section of the site, a dynamic blog records the events – workshops, seminars, press conferences etc. Blog also tracks key media highlights about LIRNE*asia* projects and outcome. Users are given the opportunity to download project documents and also make comments on our work.

Few threads during the last research cycle ran over 200 comments. Not every comment was useful, but at least some of them provided productive input. Some of our projects ideas were born from the discussions in the blog.[3]

3.3. An insight into LIRNE*asia*'s web portal usage

Increased participation is seen from the rise of number of posts and comments from Sept 2004, when we launched the site to December 2007.

---

[2] LIRNEasia's policy has always been to encourage readers making comments. We see the importance of the input the comments make to our work. We have facilitated the free flow of comments by (a) guaranteeing no editing unless otherwise essential and (b) allowing anonymous postings. Spam, and comments meant for advertising that has no relevance to the subject are removed manually.

[3] Broadband QoS Benchmarking project http://www.lirneasia.net/projects/current-projects/2241 was largely influenced by the discussions on the thread http://www.lirneasia.net/2006/05/100000-adsl-connections-how-about-speed
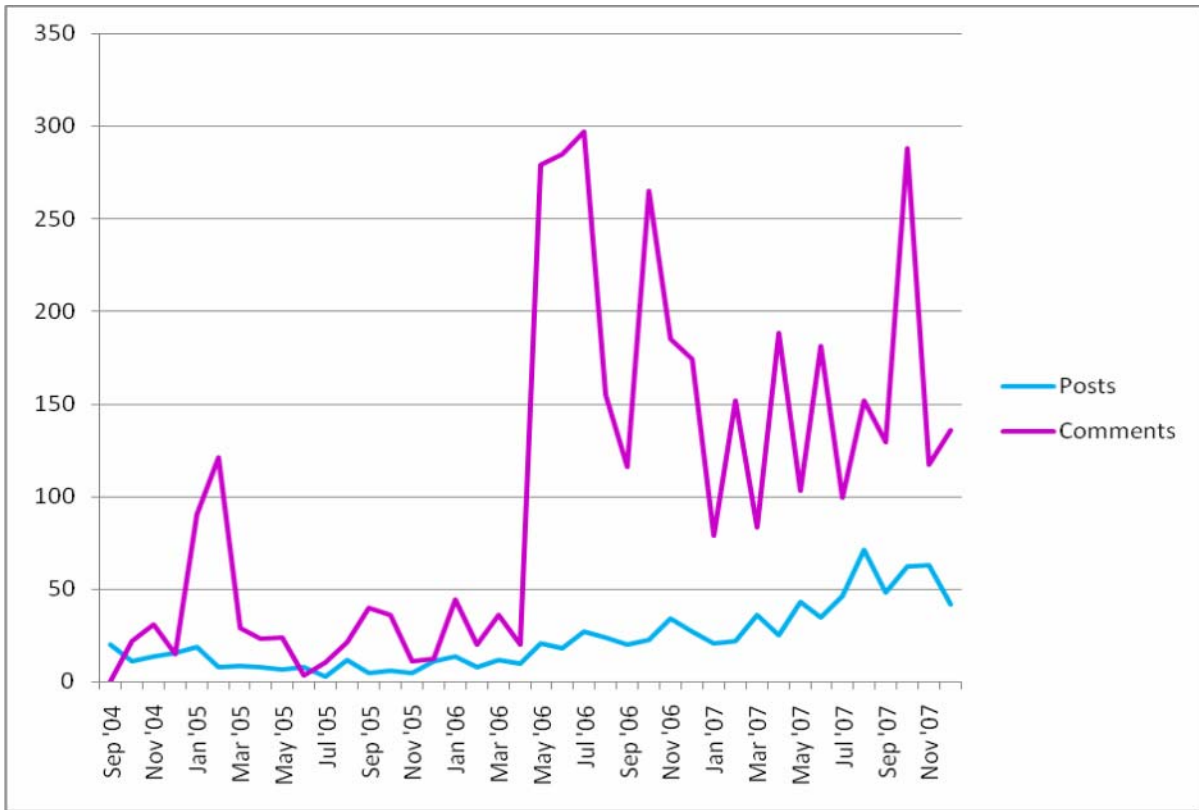
Figure 1: Number of posts and comments at www.lirneasia.net

The zigzag pattern of the number of comments indicates the changing user response to sensitive issues.[4]

The following graphs obtained from statcounter.com shows how the usage has improved notably over time.

---

[4] The sharp rise in May 2006 relates to the beginning of the discussion on local language standardization issues in Sri Lanka, which was found to be an overly sensitive issue.
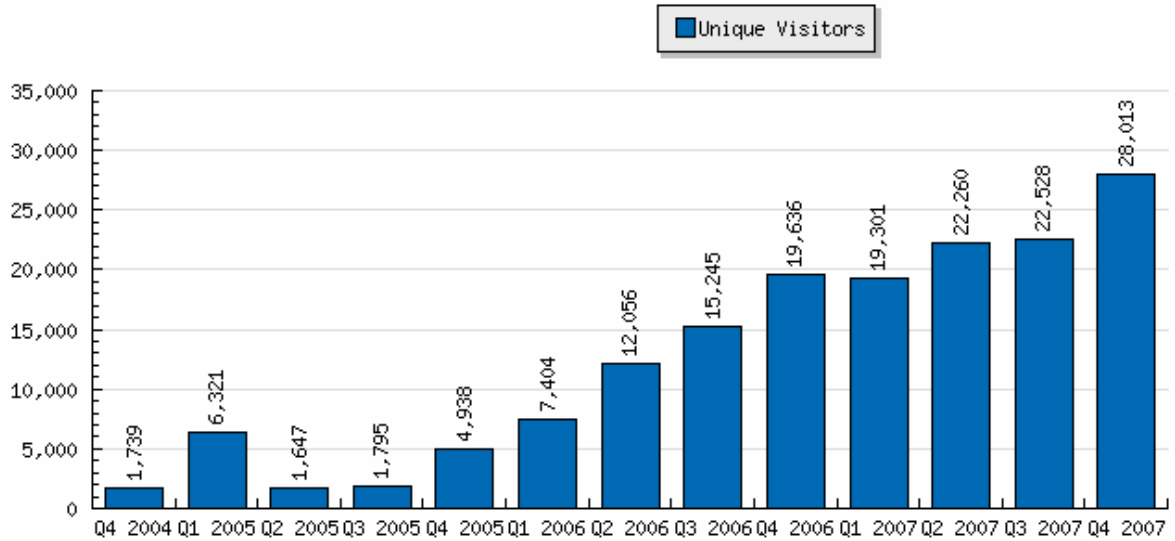
Figure 2: Number of unique visitors to www.lirneasia.net on quarterly basis for first three years

Source: www.statcounter.com
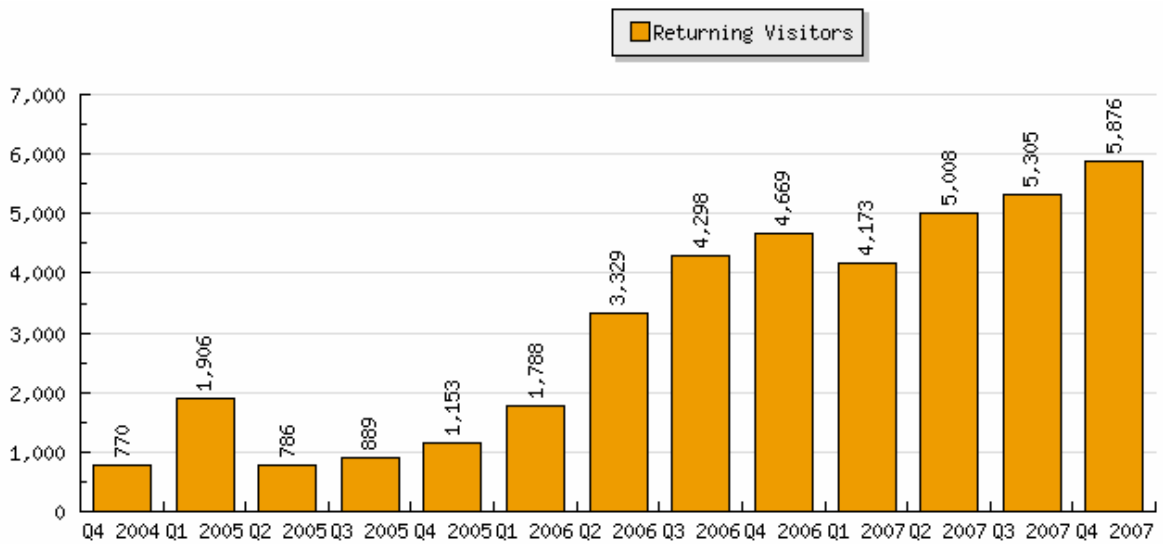
Figure 3: Number of returning visitors to www.lirneasia.net on quarterly basis for first three years

Source: www.statcounter.com
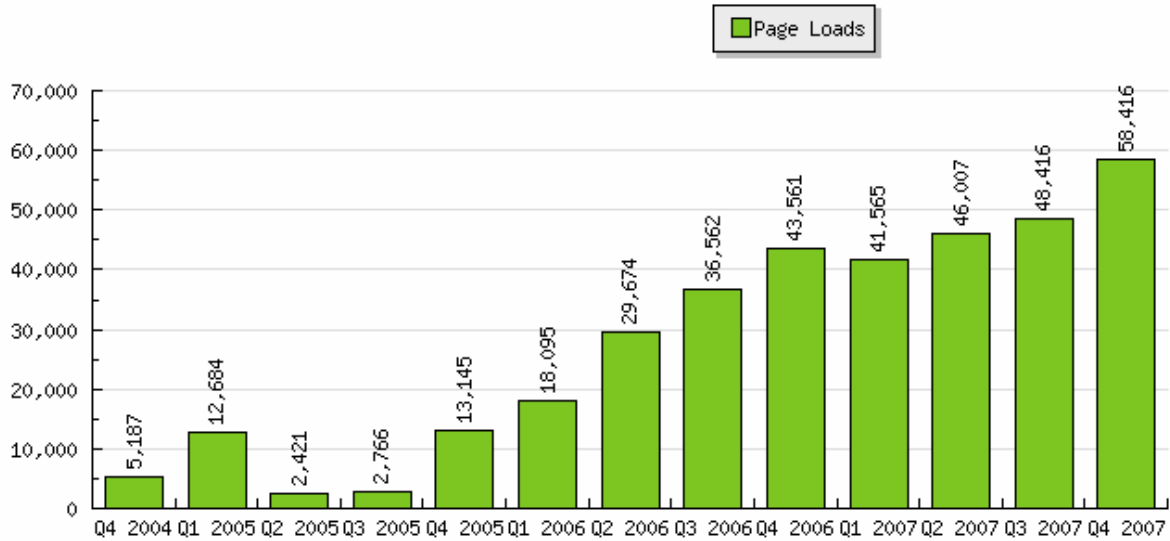
Figure 4: Number of page loads at www.lirneasia.net on quarterly basis for first three years

Source: www.statcounter.com

A deeper insight was obtained from Google Analytics for the last quarter of 2007.[5]

A. Overall

	24,946	Visits
	17,755	Absolute Unique Visitors
	56,650	Pageviews
	2.27	Average Pageviews
	00:02:29	Time on Site
	69.77%	Bounce Rate
	69.39%	New Visits

Figure 5: Overall report from Google Analytics for www.lirneasia.net for Q4 2007

---

[5] There is a slight mismatch between the numbers obtained from Statcounter and Google Analytics for Q4 2007. This is possible because applications define terms different. For example, some tools record a new visitor for one IP address/6 hours may use 24 hours or more. We find Statcounter provide a more general picture in numbers while Google Analytics presents the details, especially in percentage terms. So the results are complimentary and this mismatch is not significant as it appears to be.

(Note: Bounce rate is the percentage of the users left the site just after visiting one page.)

B. Visitor locations
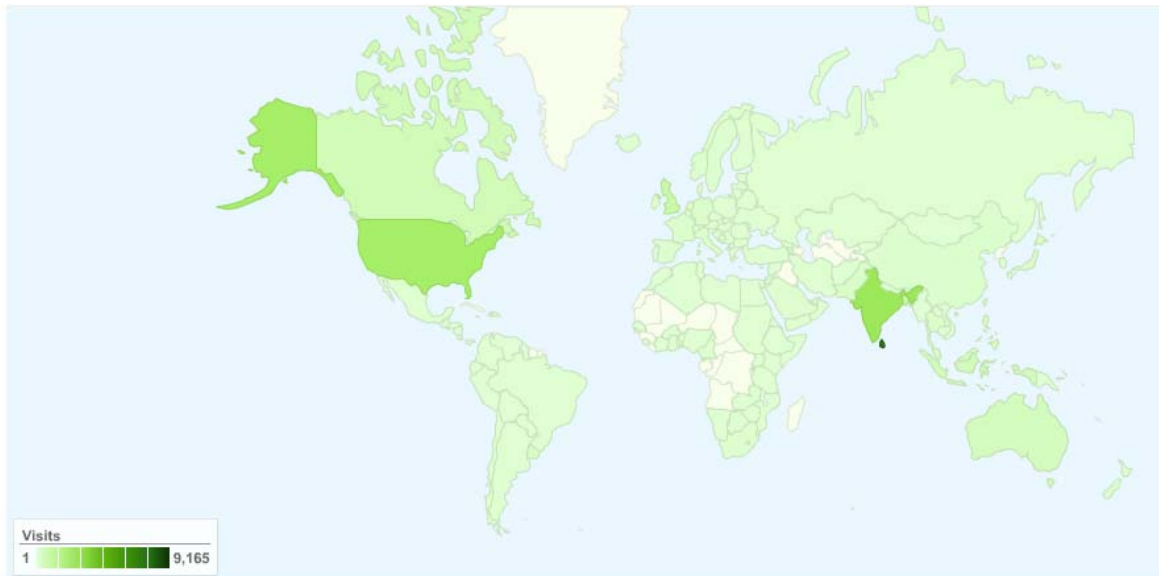
24,946 visits came from 160 countries/territories

Figure 6: Visitor mapping report from Google Analytics for www.lirneasia.net for Q4 2007 (based on visitor IP addresses)

The following table presents the top 20 countries that registered maximum number of visits.

	Country/Territory	Visits ↓	Pages/Visit	Avg. Time on Site
1.	Sri Lanka	9,165	2.74	00:04:01
2.	India	3,279	1.84	00:01:23
3.	United States	2,912	1.89	00:00:56
4.	United Kingdom	1,144	2.04	00:01:09
5.	Bangladesh	767	1.84	00:02:10
6.	Canada	724	3.11	00:02:55
7.	Indonesia	577	1.88	00:01:55
8.	Singapore	549	2.61	00:02:30
9.	Australia	538	2.27	00:01:56
10.	Malaysia	379	2.04	00:03:34
11.	Philippines	331	1.85	00:01:48
12.	Pakistan	280	1.62	00:01:13
13.	Uruguay	253	1.02	00:00:01
14.	Japan	237	1.94	00:01:37
15.	Germany	219	3.05	00:01:52
16.	United Arab Emirates	196	2.03	00:01:36
17.	Hong Kong	192	1.87	00:01:31
18.	Thailand	165	1.79	00:01:28
19.	China	160	1.63	00:01:53
20.	France	159	1.64	00:00:40

Table 1: Visitors' geographical origin report from Google Analytics for www.lirneasia.net for Q4 2007

C. New visitors vs. returning visitors

	Visitor Type	Visits	Visits	Visitor Type contribution to total: Visits
1.	■ New Visitor	17,310	69.39%	
2.	■ Returning Visitor	7,636	30.61%	

30.61%
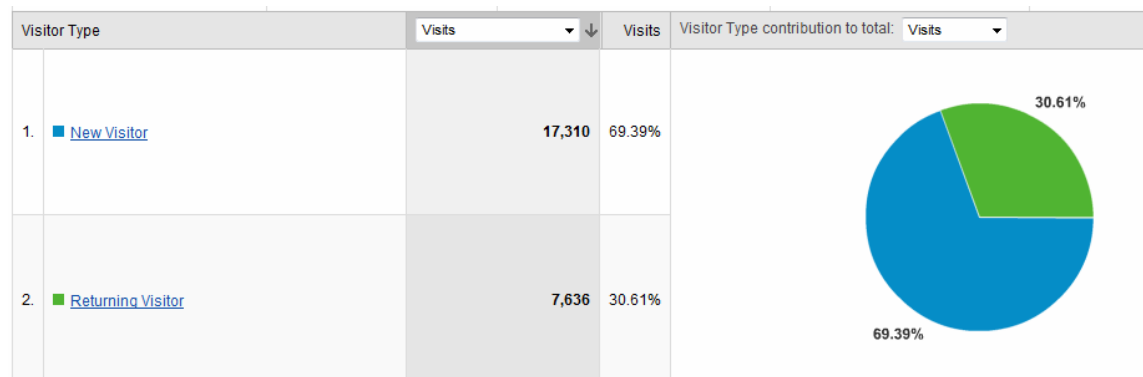
69.39%

Table 2: Visitors category (New vs. Returning) report from Google Analytics for www.lirneasia.net for Q4 2007

D. Visitor Loyalty

Number of Visits	Visits	
1 times	**17,310**	69.39%
2 times	**1,806**	7.24%
3 times	**614**	2.46%
4 times	**338**	1.35%
5 times	**215**	0.86%
6 times	**146**	0.59%
7 times	**107**	0.43%
8 times	**92**	0.37%
9-14 times	**359**	1.44%
15-25 times	**370**	1.48%
26-50 times	**505**	2.02%
51-100 times	**639**	2.56%
101-200 times	**608**	2.44%
201+ times	**1,837**	7.36%

Table 3: Visitor loyalty report from Google Analytics for www.lirneasia.net for Q4 2007

E. Depth of visit (Visit categorization based on the number of page downloads)

Depth of Visit	Visits	
1 pages	17,405	69.77%
2 pages	3,007	12.05%
3 pages	1,510	6.05%
4 pages	725	2.91%
5 pages	518	2.08%
6 pages	340	1.36%
7 pages	266	1.07%
8 pages	185	0.74%
9 pages	166	0.67%
10 pages	105	0.42%
11 pages	79	0.32%
12 pages	78	0.31%
13 pages	75	0.30%
14 pages	51	0.20%
15 pages	43	0.17%
16 pages	33	0.13%
17 pages	47	0.19%
18 pages	28	0.11%
19 pages	33	0.13%
20+ pages	252	1.01%

Table 4: Page views report from Google Analytics for www.lirneasia.net for Q4 2007

F. Length of visit (visit categorization depends upon the time they spent at the site):
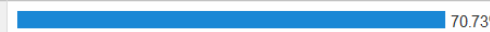
Length of Visit	Visits	
0-10 seconds	17,644	70.73%
11-30 seconds	729	2.92%
31-60 seconds	867	3.48%
61-180 seconds	1,837	7.36%
181-600 seconds	1,989	7.97%
601-1,800 seconds	1,483	5.94%
1,801+ seconds	397	1.59%

Table 5: Length of visit report from Google Analytics for www.lirneasia.net for Q4 2007

Few central conclusions can be drawn from these results.

The popularity of the site has increased linearly from Q4 2004 to Q7 2007. The only deviation was on Q1 2005. In this period, post-tsunami traffic which would have created similar patterns at many Sri Lankan based and related sites. This could have been largely because of our projects on disaster management. Once this died down, we see the normal trend continues from the next quarter.

As evident from the usage patterns in Q4 2007, the 'quality users' made 30% of the total visits. Bounce rate and the visit category according to the length of the time visitors spend at site, both which comes to about 70%, supports this point. This group approximately indicates the percentage of the 'casual visitors' who drop at the site through most probably through a search engine, but leave immediately (according to the reports within 10 seconds) when they find it not their interest. What matters is the remaining 30%, who visit for a definite purpose.

Significant number of returning visitors, as well as regular ones were observed. Of all visits, about 12% of are from visitors who have made a minimum of 50 visits during the three month period. The time spend by users at the site too is satisfactory. 23% of visits have lasted for a period of more than one minute and nearly 8% over 3 minutes. Number of visits that lasted for more than 30 minutes was 1.59% but at least bulk of this might be from staff.

The following Table compares LIRNEasia.net with few similar sites based on Technorati

Authority[6] and Rank[7]

URL	Brief description of the site	Operates since	Authority (Higher the better; Lowest 0; highest infinity)	Rank (Lower the better; best #1)
http://endpovertyinsouthasia.worldbank.org	A blog maintained by **Shanta Devarajan**, Chief Economist, South Asia, World Bank aiming to create a conversation on South Asian poverty.	18/09/2007	44	218,928
http://www.egovnews.org	A blog that collects international news articles about e-citizen, e-democracy, e-governance and e-government.	27/01/2006	16	608,616
http://ictlogy.net/	A blog about ICT4D initiatives, digital divide, capacity building, and knowledge management.	21/10/2003	88	98,602
www.lirne.net	LIRNE.NET is a Collaboration of research centres in Africa, Asia, Latin America and Europe, to facilitate telecom reform and infrastructure development through research, training, , policy and regulatory advice		7	1,245,176
www.lirneasia.net	A regional ICT policy and regulation think tank that specializes in infrastructure and active in Asia Pacific.	Sept 2004	39	249,273

Table 6: Comparison of LINREasia.net with similar sites based on technoarti

(http://technorati.com/)

---

[6] This is the number of blog links for last six months. Technorati measures the number of blogs, rather than the number of links. So, if a blog links to a site many times, it still counts as +1 .
http://support.technorati.com/faq/topic/71?replies=1 Accessed on 02/05/2008
[7] This is calculated based on how far the site from the top. The blog with the highest Technorati Authority is the #1 ranked blog. The smaller the Technorati Rank, the closer the site to the top. At the lower end of the scale many blogs share the same Technorati Rank because they have same authority.
http://support.technorati.com/faq/topic/71?replies=1 Accessed on 02/05/2008

4. Impact of VO structure on Information Systems (IS) budget

Any VO critically depends on ICTs but that does not necessarily mean an increase in Information Systems (IS) budget. On the other hand, as seen in LIRNE*asia*, VO structure could significantly cut down IS budget.

Depending upon the size of the organization, Gartner estimates the annual IS budget can be anywhere from 3.5 -7% of its revenue.[8] This constitutes, apart from the cost of client PCs and peripherals, the server side equipment which is more expensive. Servers with high reliability features cost several times more than PCs.[9] They should be provided UPS power and maintained in an air-conditioned server room with limited access. This is in addition to networking equipment (routers, switches) and cabling, if there is a wired LAN.

A typical Local Area Network setup with two servers and cabling system for a similar sized organization is estimated to cost about USD 10,000 as calculated based on the prevalent market prices in Sri Lanka as shown in the table below.[10]

---

[8] IT Spending and the IS Budget,
http://www.gartner.com/4_decision_tools/measurement/measure_it_articles/july01/mit_is_budjet1.html
accessed on March 25, 2008

[9] According to prices available in its site www.dell.com an entry level Dell desktop PC costs USD 519 while and entry level server costs USD 1,399 exclusive of server software. The price gap will be more if the server needs to be more advanced.

[10] The prices might not be accurate. To be used for illustrative purposes only.

	Item	Units	Approximate cost in USD
1.	Servers (including licensed server software)	02	7,000
2.	WAN Router[11]	01	500
3.	Switches	04	800
4.	UPS	01	400
5.	Cabling[12]	20 points	1,600
6.	Other accessories[13]		400
	Total		**10,700**
	Prices include taxes; Annual maintenance 10% of the equipment cost extra		

Table 7: Would be cost of the server setup required for a same sized organisation

Currently LIRNE*asia* saves this amount by opting for a VO structure based on a flexible wireless LAN. The annual expenditure of services, including the ones outsourced (except design) is less than USD 1,000 for the same services, not including the costs of client PC and peripherals, which should be available in any case.

LIRNE*asia*'s current structure involves three broadband links. Each connection is supposed to serve one floor but can be used at the other floors without significant reduction in signal strength. The broadband links terminate at wireless routers. Individual users are given the choice of using any accessible wireless network. Skype chat is widely for internal communications. This is in addition to using it for international communication purposes mainly as a cost reduction strategy. E-mail service for LIRNE*asia* is outsourced.

---

[11] All networking equipment are assumed to be from mid range vendors. Products from top level vendors like Cisco would be higher.
[12] Includes equipment and labour costs for structured UTP cabling done according to industry standards, but not electric cabling
[13] Server racks etc

5. Conclusions: Lessons for similar organizations

A. Meetings need not be always face to face

In a VO it is impossible to physically bring everyone to a single room for meetings. This calls for means which people can use to make virtual presence. ICTs play a key role in that process. LIRNE*asia* has experimented with multiple tools to conduct virtual meetings. The best example is the colloquia series. In addition to those who were present in the room a wider audience had access to our colloquia either though (a) Skypecast, (b) online blogging or (in rare cases) (c) telephone. Presentations slides and other relevant documents were distributed to participants via email so they can follow the discussion real time. They could also make comments through Skype or blog. Six country TRE study was one project that benefited from this arrangement most. Researchers in different countries were able to share information on other country studies and view their opinions real time.

B. Telecommuting plays a key role

Telecommuting is an essential activity in any VO. LIRNE*asia* benefited from telecommuting without enforcement or even keen encouragement. The decision to telecommute should be with the individuals, some may find working from an office is more productive, but the office structure should not be a barricade for the operation. Also this need not be confined to research work. LIRNE*asia* finance division worked partially from home, but not compromising on the efficiency or promptness of the routine operations.

C. Dynamic web portal is must for any VO

The contribution of LIRNE*asia* web portal to has been significant to the success of VO. There are other electronic means of information dissemination and sharing (eg. E-Mail, Wikipedia entries etc) but the strategy will not be complete without a dynamic web portal.

D. Building capacity within organization for electronic dissemination pays

Most organizations have dedicated staff for this purpose. Reasons why we selected not to have 'web masters' is twofold - making every team member a dynamic and interactive contributor to electronic space and of course reducing the administrative costs. In LIRNE*asia* every member, as a part of the informal orientation program learns how to make a web entry. The procedure has been documented. Project teams regularly reported the

progress. Project documents, presentations etc were shared through the web portal. Team was also encouraged to engage in discussions in the blog with readers. Capacity building on communication has been carried out different occasions. This has worked as the HR foundation layer of the VO.

E. VO model cuts down costs

VO does not necessarily mean a massive IS budget, on the contrary it can cut down Information System (IS) budget significantly. With careful planning a VO can drastically cut down IS budget. (Few tips are given in points that follow)

(a). Invest on laptops and not desktops:

Using desktops is a low cost solution for relatively stationery teams. However, at LIRNE*asia*, mobility is high. We see the inseparable correlation between an individual and PC, and providing desktops means confining their work to one desk. A laptop can provide the working environment irrespective of the geographical location as long as connectivity is established, therefore it facilitates telecommuting. Both research and administration staff have used this capability of 'working from anywhere', for smooth continuation of work. These capabilities justify the minor cos differences between the too, if any.

(b). Within office premises, choose wireless over wired solutions (with the possible exceptions in finance):

Wired solutions imply serious boundaries to flexibility of work and increase IS budget. They are also more susceptible to changes in physical environment. By using wireless solutions in office, LIRNE*asia* has provided individuals the agility to work from different locations (within the same premise), change desks with minimum hassle and also the availability of a backup link with the system if the normal connection fails. With minimum configuration efforts, they could also use the same laptops from homes or any other locality. No cable plug-ins are required to shift from one network to another.

Not cabling the premises, saves money and speeds up the process of changing office locations if the need arises. Ideal for a project based organization that needs movement depending upon the project developments.

(c). Instead of physical in-house servers, outsource server (including mail server) requirements:

Using virtual server space offer s several key advantages over maintaining physical servers. The latter are costly, and require office space and dedicated IT staff to maintain. IT staff is a luxury, LIRNE*asia* as a project based research organization could not afford. Virtual servers provide storage space and ease the IT resource management. This has given LIRNE*asia* the opportunity to focus on its core functions. The solution is sure to increase the productivity of any similar small scale research organization, without compromising the performance.

Outsourcing e-mail operations is not always advisable if any organization handles overly confidential or sensitive information. Research and development organizations, unlike private firms can plan outsourcing mail. LIRNE*asia* benefited from this move without compromising on efficiency. The system should support web based e-mail access as this is a key requirement for a mobile staff.

(e). Outsource IS design work:

LIRNE*asia*'s mandate is policy research and capacity building and we prefer to minimize our administrative functions. Outsourcing IS design was an early decision and so far it has worked effectively. Selecting a party capable of understanding organizational needs is a critical requirement.

(f). Standardise equipment:

Though we could not follow it fully, single sourcing and standardizing equipment (from a known reputed supplier) is a great idea for a small organization. Equipment stadardisation ensures minimum configuration issues and reduced call time with the supplier.

(g). Build redundancy aspects into design:[14]

Contrary to the popular belief, a VO can be an organization with least IT infrastructure and minimum IT staff. LIRNE*asia* had no IT staff. However, this does not mean every time the network facilities were down we had to wait till an engineer from the product vendor visited. How we prevented interruptions to our work was having redundancy. It costs more, but that marginal cost is justified when taken with the cost of downtime, otherwise resulted. LIRNE*asia* successfully used four broadband links from three suppliers for its small office to ensure redundancy and no downtime in its operation.

Another prerequisite will be the right attitude of the staff. However, our experience is the nature of VO is such that it cultures the attitude intrinsically with least effort.

---

[14] This is not strictly to reduce costs; but to minimize downtime which in turn saves.

Bibliography

Ahuja, M. & Carley, K. M. (1999). "Network Structure of Virtual Organisation", *Network Structure*, Vol. 10, No. 06, pp. 741-757

Bosch-Sijtsema, P.M. (2004). "Knowledge transfer framework for virtual projects", *International Journal of Networking and Virtual Organisations,* Vol. 2, No. 4, pp. 298-311.

DeSanctis, G. & Monge, P. (1999). "Introductions to the Special Issue: Communication Process for Virtual Organisations", *Organisation Science*, Vol. 10, No. 06, pp. 693-703.

Gray, P & Igbaria, M (1996). "The Virtual Society", *ORMS Today,* December, pp. 44-48.

Hughes, J. A., O'Brien, J., Randall, D., Rouncefield, M. & Tolmie, P. (2001). "Some 'real' problems of virtual' organization", *New Technology, Work and Employment*, Vol. 16, No.1, pp. 49-64

Jarvenpaa, S. L. & Leidner, D. E. (1999). "Communication and Trust", *Organisation Science*, Vol. 10, No. 06, pp. 791-815.

Marshal, P., Mckay, J. & Burn, J. "The 3 S's of Virtual Organisation: Structure, Strategy and Success Factors". Accessed on 02/01/2008, http://www.ve-net.org/ve-net/Library.nsf/ab283684d03f231d80256b520047d321/3A14C69F7DBAE32980256F6A00392562/$file/The%20Three%20S's%20of%20Virtual%20Organisations.%20Structure,%20Strategy,%20and%20Success%20Factors.pdf

Metselaar, C. & van Dael, R. (1999). "Organisations Going Virtual", *AI & Soc*, Vol. 13, pp. 200-209

Moshowitz, A. (1997). "Virtual Organisation", *Communications of the ACM*, Vol. 40, No. 09, pp. 30-37.

Moshowitz, A. (1997b). "On Theory of Virtual Organisation", *System's Research and Behavioural Science*, Vol. 14, pp. 373–384.

Okkenon, J (2002) "Performance Measurement in a Virtual Environment". Accessed on 03/01/2008 at http://www.tut.fi/units/tuta/teta/mittaritiimi/julkaisut/ifip.pdf

Palmer, J. W. & Speier, C. (1998). "Teams: Virtualness and Media Choice", *International Journal of Electronic Commerce*, Vol. 3, No. 1, pp. 27 - 48

Rahman, Z. & Bhattacharyya, S. K. (?). "Virtual Organisations: A Stratagem", *Singapore Management Review*, Vol. 24, No. 02, pp. 29-45.

Shao, Y. P., Liao, S.Y. & Wang, H.Q. (1998). "A Model for Virtual Organisations", *Journal of Information Science*, Vol. 24, No. 5, pp. 305–312.

Travica, B. (1997). The design of the Virtual Organisation: A research model. Proceedings on America's Conference on Information Systems, August 15-17, Indianapolis.

Turban, E., Mclean, E. & Wetherbe, J. (1999), *Information Technology for Management*, 2nd Ed, Wiley, New York.

Appendix I – Selected definitions of VO

"VO is related to a strategic alliance, consisting of linkages (often contract based) between cooperating partners that work in a geographically dispersed setting" (Bosch-Sijtsema, 2004, p. 229)

"A temporary network of independent linked by integrated technology to share skills, costs and access to one another's markets" and "an organisation distributed geographically and whose work is communicated through electronic communication"(Rahman & Bhattacharyya, pp. 39-40)

"Virtual organization applies to goal-oriented activity. This includes much (but not all) of the activity undertaken by biological, social, and artificial systems", and "The author first conceived the idea of virtual organization as an analogy between virtual memory and the practices of multinational firms" (Mowshowitz, 1997b, p. 374).

"They consider the virtual organization to be an organisation that is continually evolving, redefining and reinventing itself for practical business purposes" (Metselaar, C. & van Dael, R., 1999, p. 201)

"A Virtual Organisation is a collection of geographically distributed, functionally and/or culturally diverse entities that are linked by electronic forms of communication and rely on lateral, dynamic relationships for coordination" (DeSanctis & Monge 1999, p. 693)

"The phrase 'virtual organisation' stands for a task, project or permanent organization which is decentralized and independent of any spatial connection" (Okkenon, 2002, p. 2)

"VO's (virtual organizations), refers to a new organizational form characterized by a temporary or permanent collection of geographically dispersed individuals, groups or organization departments not belonging to the same organization—or entire organizations, that are dependent on electronic communication for carrying out their production process" (Travica, 1997 in Hughes et al, 2001, p. 49)

"VO can be defined as composed of several business partners sharing costs and resources for the purpose of producing a product or service ….. can be temporary…… or can be permenant. Each partner contributes complementary resources that reflect its strengths, and determine its role in the virtual corporation." (Turban et al, 1999, p. 142 in Marshal, Mckay & Burn, (?) p. 2).

And "Virtual Organisation is put forward as a low cost, highly responsive and adaptable way to organise and compete in the face of extreme turbulence and uncertainty in the business environment" (Marshal, McKay & Burn, p. 4).

"Organisations are virtual when producing work deliverables across different locations, differing work cycles and across cultures" (Gray & Igbaria, 1996 and Palmer & Speier, 1998 in Burn, Marshal & Wild, p. 2).

"We define virtual organisation as a geographically distributed organisation who members are bound together by a long term common interest or goal who communicate and coordinate their work though information technology", (Ahuja & Carley, 1999, p. 742).