"Building Sustainable Global Collaborations in a Distributed World: Challenges for NRENs, Industry and the growth of Regional Data Centers"

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Report on:
TEIN3 HRD Programme 2010
Application Workshops

Competing Globally in a Regional World
AINTEC Workshop 15-16 November 2010

Objectives

This workshop explored a set of issues that outline the tensions between computational efficiency and the constraints on data access and use that will underpin the growth and sustainability of global collaborations around shared access to data, expertise and compute resource. In particular it considered the role of regional rather than global data centers and what this might offer collaborations around data whose potential value to organizational competitiveness cannot be assessed before it is accessed.

Methods

The workshop approach was interactive and focussed on developing participants' ideas about competitiveness using a number of tools that helped participants to formulate and structure their ideas and provide 'real-time' feedback to others. These techniques have been used successfully in the Research Councils UK – Ideas Factory[1] and were adapted for this workshop. The general approach may be characterised as 'Challenge – Respond – Reflect – Review' within a group setting, membership of which evolves as participants cluster around shared ideas and objectives. *It is this self-selecting membership that was intended to deliver collaborations to take forward from the workshop.*

Speakers presented short talks intended to challenge participants' thinking, and as the workshop progressed the talks became more focussed on specific issues.

Participants were initially allocated to groups (group composition changed later as participants elected to work together on common interests) and responded to the talks using the following techniques:

[1] http://www.rcuk.ac.uk/kei/ktportal/Pages/Glossary.aspx

WIBNI: 'Wouldn't it be nice if …': after talks groups were asked to write down *WIBNIs* or challenges that related to the talk and reflected their own interests.

Clustering: this was used to group the themes that emerged from the workshop and used to identify potential business projects, around which the groups can re-form so that participants work with people who have overlapping interests.

This 'real time review' process was intended to bring in the expertise of all participants and help local groups make links with relevant interested parties participating via Video-Conference links, establishing a wider collaboration for the group that could be taken forward from the workshop.

Participation

Appendix I lists the registered participants. Informal attendance also took place as a result of co-location with AINTEC, though this was not tracked through registration.

The circulation of the Call across the high performance computing and communications communities also stimulated contacts outside the workshop, notably contact with the government of the Kingdom of Cambodia. This might provide further opportunities to take the work forward outside Thailand, but this report will focus only on the material discussed by the speakers and participants at the event.

Unstructured thinking – WIBNIs & Challenges

Challenges identified crossed the local/global divide and included:

- Infrastructure access is limited and acceptable use policies defining access to shared national facilities are evolving rather than static, leading to planning difficulties
- Licensing – the difficulty of mixing commercial and academic research in an environment where the licensing may not be appropriate
- Recruitment – competing for talent and employment that might need to reflect commercial imperatives rather than a traditional university environment
- Sharing of both compute cycles and skills was considered more difficult locally than in other regions given their co-dependence and heterogeneity
- Information goods were more expensive locally – including core application software that international partners might assume were at the same cost or cheaper. This was seen to promote a grey market, any dependence on which created barriers to collaboration
- Privacy/Security concerns and regulations were seen as potentially restrictive and possibly offering a competitive differentiator if they enabled participation in specific markets for specialised analyses (see comment on Germany's privacy law below)
- Open source software was described as 'Western' by one group with the open source movement having limited participation from East Asia and hence limited opportunities to make this type of software reflect local needs

WIBNIs related to increasing local participation in the global knowledge economy:

- Changing youth behaviour – Information and Communications Technology (ICT) is key for competitiveness, not 'just' consumption
- Creating a global vision of Thailand's place in a global future, so that industry and government can respond
- Creating a software quality assurance service to give locally produced software access to wider markets – example cited was medical equipment software giving variable results with implications for adoption

Businesses that would benefit from better access to ICT were wide-ranging:

- Supermarkets – helping local retailers to compete with international chains such as Tesco and 7-Eleven
- Agriculture in general would benefit from better flood prediction
- Hospital Tourism
- Logistics – leveraging local knowledge through wider access to ICT
- Redefining the supply chain – using ICT to help Sugar Refiners manage the supply chain all the way back to primary producers. This can help manage the volatility currently being experienced with its consequences for employment all the way along the chain.

Structured thinking – The Business Model

Business Models were used in this workshop to help structure participant's ideas and make them easier to communicate. The idea of a business model is very common; however this means that there are a number of definitions, opening up the potential for miscommunication. To help counter this we focussed on the Wikepedia definition:

'A business model describes the rationale of how an organization creates, delivers, and captures value. Value may be economic, social, or other forms of value.'

The Business Framework used in this workshop drew directly from the same source:

www.businessmodelgeneration.com/downloads/businessmodelgeneration_preview.pdf

- which was chosen because it presents a model in plan form, and it has been widely tested in workshop environments:

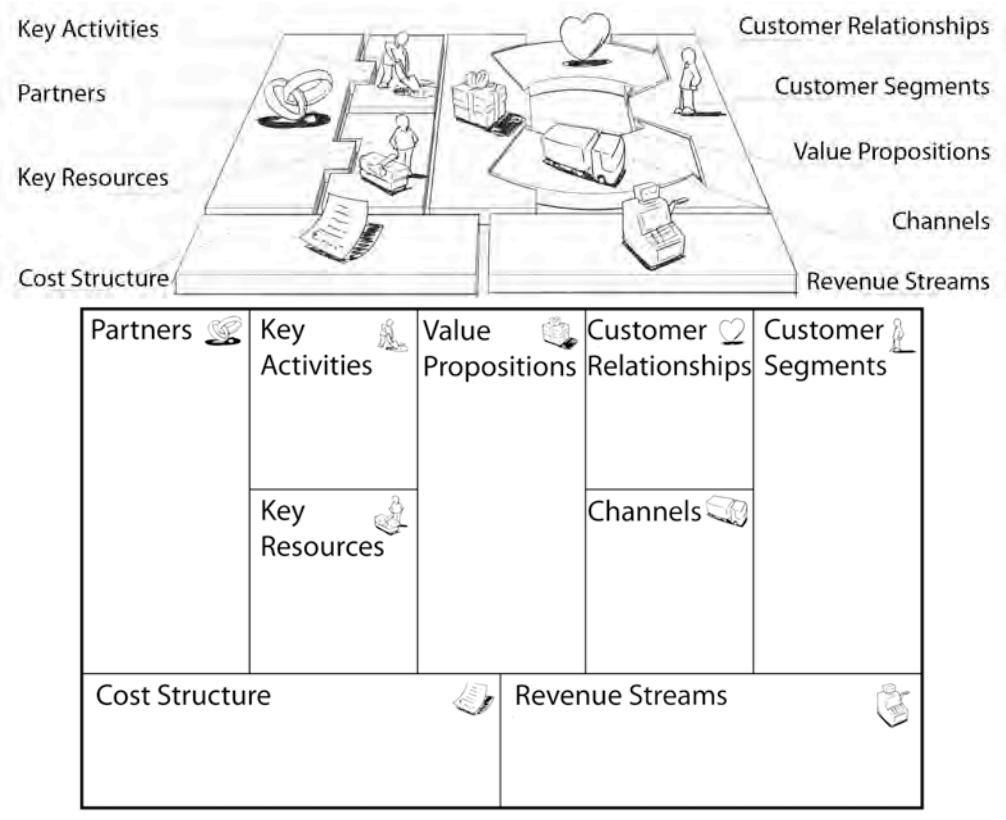

Figure 1: A Business Model showing the key elements and principal interactions. Source www.businessmodelgeneration.com.

The main elements of the Business Plan were discussed in terms of the examples taken from the above Wikepdia source and cross-referred to examples given in talks by ***speakers*** or in the WIBNI responses and discussions with *participants*. For record, we include this narrative below:

Customer Segments: the different groups of people or organizations an enterprise aims to reach and serve. A segment is defined as having common needs and common behaviours.

An example of a customer segment could be young Thais who have Internet access on their phones and download music from companies like Apple. Concerns about this segment expressed by participants were that such technologies are seen by youth in Thailand as means of consumption rather then production – 'they consume, but they don't contribute'.

Value Propositions: the bundle of products and services that create value for a Customer Segment. This is the reason why customers turn to one company over another. Some Value Propositions may be innovative and represent a new or disruptive offer. Others may be similar to existing market offers but with added features.

Value can be an emotional response to a specific brand. In the example of Apple above, the direct value of a convenient method of accessing music can be seen as a 'disruptive' technology with strong brand association with innovative design across a range of products, from computers to mobile phones, that have overlapping feature sets - consumption of any of which promotes cross-sales of the others.

In the case of the Workshop, some general 'Value Propositions' were present in the discussions:

***Performance** – the impact of faster computing and communications technology – making predictions of flood warnings, or sugar cane yields easier to predict in advance*

***Price** – the impact of Cloud Computing on the cost of providing a service.*

*Together these can create further value for the consumer, such as **Cost Reduction** in their operations and **Risk Reduction** in their operations. Note **Prof Arthur Trew's** observation that it is the value that you can add to the value of the organisations that buy from you that is key to long-term business success.*

Channels: how a company communicates with Customer Segments to deliver a Value Proposition. Communication, distribution, and sales Channels comprise a company's interface with customers.

*Channels play an important role in the customer experience, from helping customers to choose one company's products over anothers, purchasing it and receiving support. **Michael Clouser** described how Software Companies typically grow into service companies, whose principal value is the support they provide after a purchase has occurred.*

Customer Relationships: describes the types of relationships a company establishes with specific Customer Segments to both acquire and then keep market share.

*Customer Relationships play a key role in developing markets that are enabled by global technologies but establish values that are hard for competitors to imitate. **Prof. Arthur Trew** mentioned the 'think globally, act locally' approach that provides opportunities for selling into global markets, but helps protect the ones that are closest to you.*

This issue was discussed in the workshop groups in terms of where Thailand competes in markets where it has a clear advantage, such as Silk Textiles and Design, protected by close relationships with the production process.

In later discussions with the EU participants, ***Terence Sloan*** *also noted that this could also apply to collaborations between HPC centres on issues like Flood Risk Modelling since the frequency with which this occurs within Thailand provides opportunities for local relationships to flourish, whilst the ability to validate simulations more frequently would be an important and enduring input to collaborations with centres outside Thailand who seek to develop better prediction models, with value to other nations and related industries such as insurance industries.*

In terms of generic Customer Relationships, this approach combines local User ***Community*** *development with* ***Co-creation*** *where organisations like* ***EPCC*** *can be seen as customers for data and expertise that lead to shared development of better algorithms and models.*

Revenue Streams: the cash a company generates from each Customer Segment. The question that must be answered is: 'For what value is each Customer Segment truly willing to pay?'. Getting this right allows a firm to generate one or more Revenue Streams from each Customer Segment.

Each Revenue Stream may have different pricing mechanisms, and as ***Michael Clouser*** *noted – it is naïve to price in terms of cost – the important price is the one that the market will bear. His example was Starbucks, where the value of the brand allowed much higher profit margins. Similarly, the price of a successful Sugar Cane yield prediction system is not the cost of the Cloud cycles required to run it, but the value such predictions have for the profitability of the whole industry. Note that similar arguments can be applied to successful risk management Flood Warning models however, the benefits to society of such systems mean that they are often developed using different funding models. This echoes points made by* ***Prof Arthur Trew****, who noted that it is not just the revenue stream that businesses in this sector should consider, but also the relationships that reduce costs. In these two examples there are different opportunities for reducing costs, with Sugar Cane seen as a local issue with commercial value, whilst Flood Risk Modelling tied to Flood Warning systems has both commercial and social benefits that might be used to broker much wider funding streams, including those from technology suppliers who may wish to 'co-create' solutions. See sections on Cost Structure and Key Resources.*

Key Resources: are the most important assets required to make a business model work. These allow an enterprise to create and offer a Value Proposition, reach markets, maintain relationships with Customer Segments, and earn revenues. Different Key Resources are needed depending on the type of business model.

Examples include a microchip manufacturer that requires capital-intensive production facilities, whereas a microchip designer focuses more on human resources. This was observed by ***Prof. Arthur Trew*** *who described EPCC as being 'about people, not facilities' - indeed it was the skills base that made the facilities cheaper to procure.*

Key Activities: describes the most important things a company must do to make its business model work. Like Key Resources, they are required to create and offer a Value Proposition, reach markets, maintain Customer Relationships, and earn revenues. And like Key Resources, Key Activities differ depending on business model type.

*For software companies such as Microsoft, Key Activities include software development. For PC manufacturer Dell, Key Activities include supply chain management. For organisations like **EPCC**, Key Activities include problem solving.*

Key Partnerships: describes the network of suppliers and partners that make the business model work. Partnerships are becoming a cornerstone of many business models, created to optimize their business models, reduce risk, or acquire resources.

There are four different types of partnerships:

- *Strategic alliances between non-competitors*
- *Coopetition: strategic partnerships/cooperation between competitors*
- *Joint ventures to develop new businesses*
- *Buyer-supplier relationships to assure reliable supplies*

In a commodity market of the type being created by Cloud vendors, Buyer-Supplier partnerships are unlikely. Discussions at the Workshop were focussed higher up the 'Value Add' chain, where projects were discussed that could be described as Joint Ventures – where complementary skills and technology access could be used to 'co-create' new products, such as Flood Risk Modelling and Warning systems. This might also be seen as a form of Coopetition, as competition will still exist in other areas, e.g. for project funds from EU-Asia research initiatives as the capabilities develop locally and role definitions change.

Cost Structure: describes all costs incurred to operate a business model, i.e. the costs of creating and delivering value, maintaining Customer Relationships, and generating revenue. Such costs can only be calculated after defining Key Resources, Key Activities, and Key Partnerships.

*Some business models are more cost-driven than others. So-called "no frills" airlines, for instance, have built business models entirely around low Cost Structures. **Prof Arthur Trew** noted that the cost model at EPCC traded on the key skill set to reduce the cost of facilities.*

*Note the circularity of a Business Model here – is it better to think of **Prof Trew's** comments of skill assets being used to deliver cost reductions as part of the Cost Structure or a Revenue Stream?*

Putting it all together in a Business Model?

This is one of the objectives of the Workshop and needs to come from participants. However, businessmodelgeneration.com offers one accessible example of how a business model for Apple Computers might be described in terms of how it appeals to the opening example of a Customer Segment of young Thais who value the entertainment associated with on-line music.

Figure 2: Example Business Model arising from the workshop process. Source www.businessmodelgeneration.com.

Respondents in the workshop were invited to express their business ideas using the same format (see Figure 3 and Figure 4).

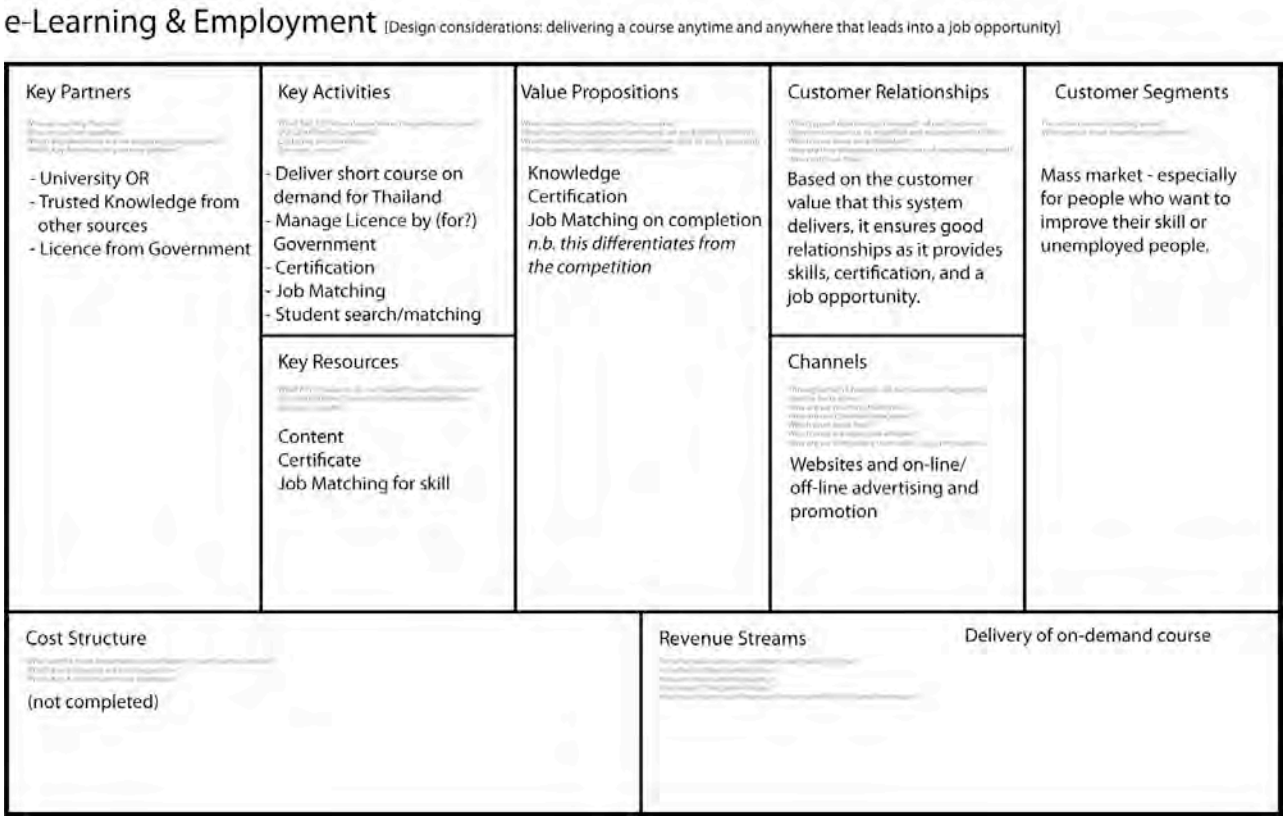

Figure 3: Focus on participant's ideas: A Business Model for On-Line Education in Thailand, emphasizing links with Government and Industry as competitive barriers.

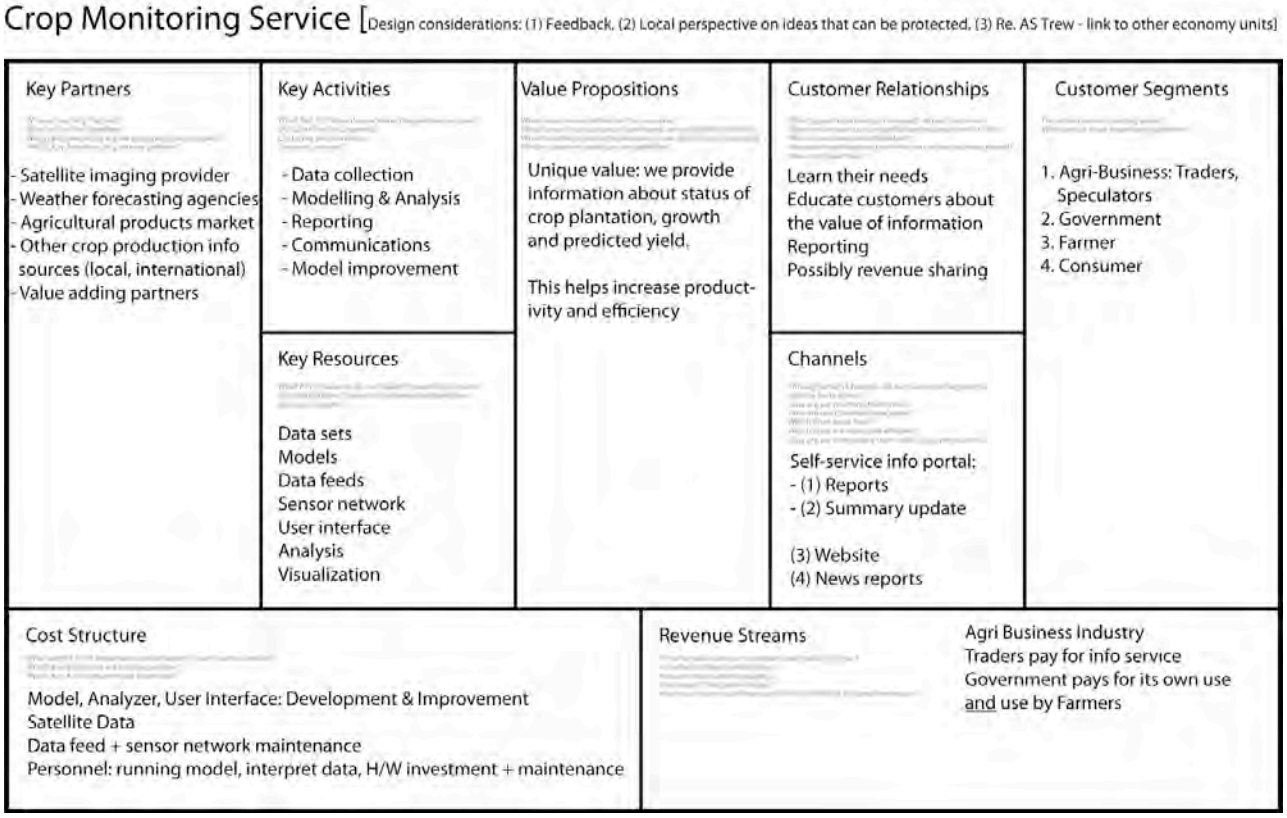

Figure 4: Focus on participant's ideas: A Business Model for a Crop Monitoring Service, emphasizing technology transfer links between university and industry, recognising the role of industry on supply-side measures.

An EU Perspective on the Issues

- Skills issues resonated with Michael Clouser's talk on trans-national company creation
- Infrastructure disparities is a common problem, e.g. in South Africa where computing power is available but business bandwidth is poor
- Skills transfer becomes the most direct means of building collaborations given the EU interest in Asia and investment in infrastructure for access
- China-US-Japan Free Trade Agreement developments show that access to EU/Global trade from countries like Thailand might be through better access to regional markets which themselves have better access to global markets
- Centres in the EU, such as EPCC, have an important role in developing sustainable relationships, where cost base may be very different at each end of the collaboration (countries like Thailand can be more expensive in areas that are not anticipated by EU partners).
- Laws vary across national boundaries, raising the possibility that Thailand is able to participate in ways that other Asian countries cannot (e.g. distinctive privacy laws in Germany that impact portability)
- Perspective shift is needed – Licensed software is expensive in Thailand and Open Source is not seen as an industry standard. A shift here would create opportunities in Thailand for broader participation on a much lower cost basis
- Open Source barriers are also language related. Crossing these barriers is a potentially profitable exercise for Thailand – witness Global Education & Technology Group Ltd in China raising US$76.9m on the US NASDAQ for teaching and examining competence in the English language [announced November 8, 2010]

Crossing Barriers – lost in Translation?

- What does it mean to be a 'not for profit' organisation?
- Industry roles are well understood in EU, US – and reflected in licensing laws
- NFPO example in Thailand runs a university, a calibration service and a publisher – participation with these NFPOs might be expected on a commercial cost basis when they have a role and cost structure that would not support that and make 'equal' collaborations more expensive in Thailand than for organisations like EPCC
- Hence a different skill set is needed for organisations like EPCC to focus on skills and knowledge rather than assumptions that infrastructure allows identical roles at either end of the collaboration across infrastructure like TEIN3 can be supported
- This may make Intellectual Property (IP) agreements more complex, but might be viewed as a transitional issue that provides a different structure to the relationship and has to be accommodated within the EU rather than in Asia

Overcoming hurdles - opportunities

- To reflect the disparity in cost/performance, global access should focus on a very differentiated niche market opportunity and get a premium in pricing to cover this high cost structure
- Making open-source software easier to use locally might form the base for a service industry that increases participation and gives access in both directions
- This would make it easier to tackle licensing agreements that perpetuate reliance on a grey software market
- Cloud software licensing not yet developed to equalise access – possibilities of national licensing and local Cloud provision to (load) balance and license access to regional providers (this might be viewed as a similar role to the UK Government gCloud[2])
- Demand for Cloud services on a spectrum from a virtual machine to a virtual machine room – the latter makes efficient provision harder for scale providers and may offer a niche for local Cloud suppliers

Building a Euro Asian Community

- Existing collaborations tend to focus on stakeholders from academic rather than business communities which may impact appropriation, reinvestment and sustainability of partnerships
- Barriers to Open Source adoption – using Open Source is not a problem for high-end users as English skills are good, however there are few incentives to use those skills to widen local participation by contributing to Open Source development. Though Open may not necessarily be seen as 'Western' there was a perception amongst some participants that contributions from Asia may not be welcome, reinforcing the lack of incentives for those who already have the requisite skills
- Funding a community – bilateral or multilateral agreements. This is a key point – the label of Europe or Asia can impede relationships that are traditionally brokered on a country-by-country basis. Though the EU has used centrally-funded initiatives to draw larger consortia together, this funding may be devolved in future, moving to a subscription funding model. This is creating uncertainty in Asia about the best way to make the connections – are we

[2] http://www.cabinetoffice.gov.uk/sites/default/files/resources/government-cloud.pdf

going back to a system where access to Europe will be easiest through a single country link, leaving intra-EU links to one EU country partner?

Preliminary Observations

The workshop was intended to '*to bring together industry, government and academic participants to explore these issues from differing social, technical and legal perspectives, structured by a critical focus on existing Eurasian collaborations carried by GEANT & TEIN3 infrastructure across a region inhabited by more than 70% of the world's population and the majority of current economic growth*'.

Industry and academic concerns were well represented, however the active participation of government representatives was low. This was compensated for, to some degree, by the participation of IT consultants and a Thai ISP, who all cited the important role of government in every business model and in regulating the competition.

One example given was the unintended consequence of security interventions in the ISP market. Should website content be found that contravenes a regulation then the servers are confiscated, creating little impact for the criminal who is highly likely to be technically competent and simply moves a backup to another provider, but which causes severe business continuity problems for the local business using a web-hosting service that now needs to find another host to re-load their own backup since the ISP may have lost all their hardware and data.

The feeling from the ISP provider was that this encourages local businesses to move 'off-shore' where the risks of operating through a non-local provider are seen as lower than the business continuity risk of local sourcing. This in turn reduces job opportunities for youth in Thailand who want to contribute to a knowledge economy rather than simply consuming – linking directly to a WIBNI expressed in the first group breakout session.

Every business model and most of the challenges placed Government as a major enabler and barrier to progress, with workshops such as ours felt to be important in forming, and perhaps influencing, such priorities.

Going Forward

This workshop was intended to identify local groups with specific business model instances to work with in exploring.

There are three potential 'business' cases to explore for which infrastructure and bandwidth have cost implications:

(i) Public/Private: On-line education – bringing together the interests of two parties – a Japanese-funded private university and training organisation, and the publicly funded respondent in Figure 3.
(ii) Supply-side interventions: Remote sensing and Flood Prediction/Crop Monitoring (Figure 4).
(iii) Global Skills Transfer vs. Local Regulation: Local ISPs developing market for website hosting, co-location, DNS and design

These provide a very rich set of issues to explore, some of which were disclosed as confidential, commercially sensitive issues that are beyond the scope and purpose of this report. These will be followed up with the groups individually.

Appendix I – List of registered participants

Note. NeSC = UK National eScience Centre

Name	Organisation	Attendance
Dr Mario Antonioletti	EPCC	via VC from NeSC
Miss Suthilux Chanasuc	Agricultural Governance	Local Participant
Mr Prajak Chertchom	Technology Promotion AssociationThai-Japan	Local Participant
Mr Michael Clouser	University of Edinburgh	via VC from NeSC
Miss Jessica Dennison	Edinburgh University	Local Participant
Dr David Fergusson	The University of Edinburgh	via VC from NeSC
Mr Rath Jairak	Chiangmai Rajabhat University	Local Participant
Miss kallaya Jairak	Rajabhat Chiangmai University	Local Participant
Prof Kanchana Kanchanasut	Asian Institute of Technology	via VC from NeSC
Mr Ali Khajeh-Hosseini	University of St Andrews	via VC from NeSC
Miss Jutharath Leelarkunvej	Chulalongkorn University	via VC from NeSC
Dr Benchaphon Limthanmaphon	KMUTNB	Local Participant
Dr Ashley Lloyd	University of Edinburgh	Local Participant
Mr Ian Murphy	Edinburgh University	via VC from NeSC
Dr Suhaimi Napis	Universiti Putra Malaysia	Local Participant
Miss Chantip Ongbhatara	Bhatara Progress Co.Ltd.	Local Participant
Dr Phoemphun Oothongsap	King Mongkuts University Technology North Bangkok	Local Participant
Mr Atip Peethong	HAII	Local Participant
Mr Wiboon Phatrapiboon	Government Information Technology Services	Local Participant
Dr Prasong Praneetpolgrang	Sripatum University	Local Participant
Dr Akara Prayote	KMUTNB	Local Participant
Dr Nimal Ratnayake	Lanka Education and Research Network	Local Participant
Mr Terry Sloan	University of Edinburgh	via VC from NeSC
Prof TinWee Tan	National University of Singapore	via VC from other nodes
Dr Panjai Tantatsanawong	UniNet/ThaiREN	Local Participant
Prof Arthur Trew	EPCC	via VC from NeSC
Dr Sornthep VANNARAT	National Electronics and Computer Technology Center	Local Participant
Miss Cherapa Wannasuk	Align	Local Participant
Miss Yixuan Wu	Fudan University	Local Participant

Appendix II Pictures of the Workshop

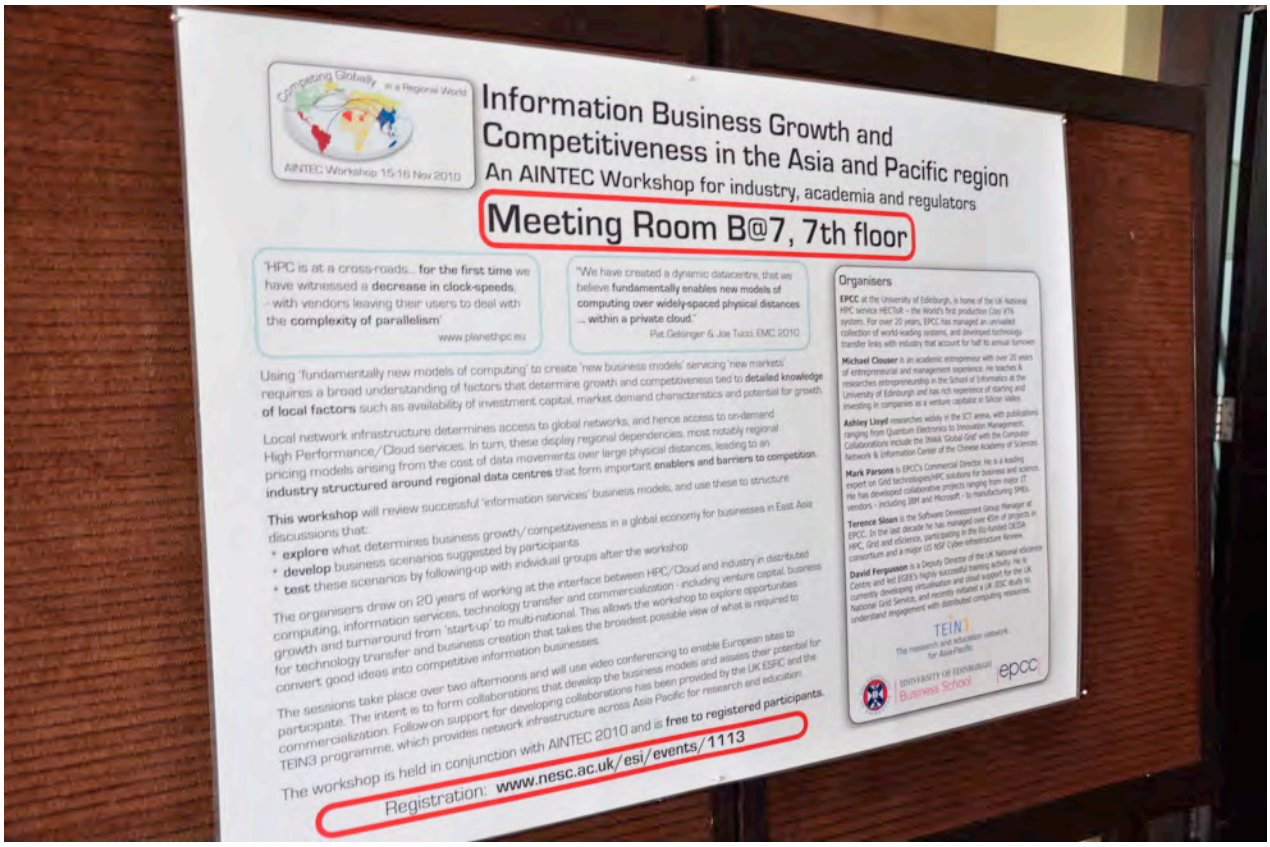

Figure 5: Meeting Information Poster

Figure 6: Workshop Break

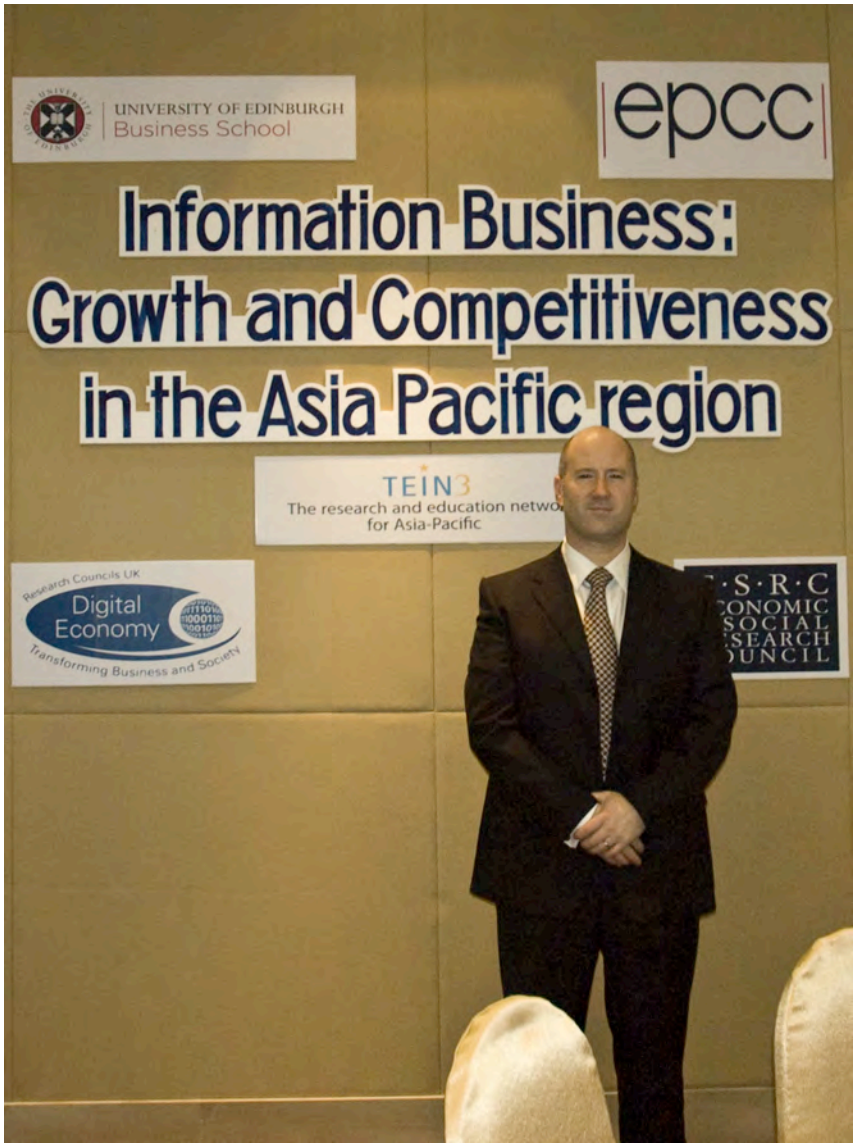

Figure 7: Workshop Title acknowledging Funding Partners.

Figure 8: Summarising Day 1 - Ashley Lloyd.

Figure 9: Building a business in Thailand - Prajak Chertchom, General Manager, Technology Promotions Association, Thailand.

Figure 10: Building a EuroAsian Community - Sornthep Vannarat.

CONFIDENTIAL – NOT FOR CIRCULATION

Appendix III: Workshop Programme

Bangkok	Edinburgh	Central Europe	Description	Speaker
Mon 15 November 2010				
12:00-14:00			Local Registration (and lunch) - Bangkok	
Enablers and Barriers to Global Collaboration				
14:00	07:00	08:00	Welcome	Kanchana Kanchnasut
			Professor, Computer Science, School of Engineering and Technology ***Director, Internet Education and Research Laboratory, Asian Institute of Technology, Thailand***	
14:10	07:10	08:10	Aligning Local Interests and Opportunities with Regional Infrastructure and Computing Architecture	Ashley Lloyd Terence Sloan
14:30	07:30	08:30	Response 1: Issues of alignment – *WIBNIs or Challenges posted on 'wall'*	Groups 1-5
14:45	07:45	08:45	From Business Models to Sustainable Business	Michael Clouser
15:15	08:15	09:15	Response 2: Business types & Opportunities – *posted on 'wall'*	Groups 1-5
15:30	08:30	9:30	Coffee/Tea - Cluster Types, Opportunities and Issues – *then separate into focussed groups by cluster*	Groups 1-5 - becoming Groups A-E
16:00	09:00	10:00	Capturing Requirements and Building a EuroAsian Community	Sornthep Vannarat
16:30	9:30	10:30	Information Businesses: experiences in the Asia and Pacific region - moving from 'Wouldn't it be Nice If (WIBNI)… , to Plusses, Potentials and Concerns (PPC). *Surfacing issues 'on the wall' – local session using RCUK SandPit techniques giving participants opportunities to present* [watch only from EU]	Ashley Lloyd (Facilitator) (i) Groups A-E make verbal presentations linking Issues to potential Business Models (ii) PPC review by 'Post-It' notes
CLOSE LOCAL SESSION (COFFEE BREAK-EU)				
18:00	11:00	12:00	From Business Models to Sustainable Business – EU specific	Michael Clouser
19:00	12:00	13:00	Working with Information Businesses in the Asia and Pacific region – responding to WIBNIs and PPCs *Surfacing issues 'on the wall' – local session using RCUK SandPit techniques [EU VC]*	Terry Sloan and Mario Antonioletti (Facilitators)
CLOSE EU SESSION				
20:00	13:00	14:00	Summarising and Structuring	Workshop Organisers
21:00	14:00	15:00		
CLOSE ALL				

Bangkok	Edinburgh	Central Europe	Description	Speaker
Tue 16 November 2010				
12:00-13:00			Lunch - Bangkok	
13:00			Feedback – aligning AP and EU perspectives	Ashley Lloyd
13:30			PPC – *responses from the groups, a focus on 'gap' analysis*	In interest-specific groups
14:00	07:00	08:00	Summarising Day 1 and introducing Day 2	Ashley Lloyd
14:30	07:30	08:30	From Training to Technology Transfer: experiences from an EU perspective in the Asia and Pacific region and opportunities/challenges presented by Cloud Computing	David Fergusson
15:00	08:00	09:00	Disruptive Technologies & Investment - *responses from the groups, a focus on how Cloud service models might impact their local business models*	In interest-specific groups
15:30	08:30	9:30	Coffee/Tea - *presentations continue*	In interest-specific groups
16:00	09:00	10:00	Many alignments – One Business Model: EPCC@20	Arthur Trew
16:30	09:30	10:30	The local Business Environment: *ranking the challenges as we move from concept to creation*	In interest-specific groups
17:00	10:00	11:00	Bringing it all together – *group presentations on the way forward, principal challenges and required collaborations*	In interest-specific groups
17:30	12:30	13:30	Q&A: EU response – *direct comments and questions addressed to groups*	Terry Sloan and David Fergusson (Facilitators)
18:00	13:00	14:00	Next steps – canvassing collaborations, committing to action.	'on the wall' facilitated by Ashley Lloyd and Terry Sloan
CLOSE LOCAL SESSION (COFFEE BREAK – EU)				
18:30	13:30	14:30	Wrap-Up EU – Comments, Feedback and Commitments	Workshop Organisers
CLOSE ALL				