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Final Technical Report

**Statistical Compilation of the ICT Sector and Policy Analysis:
A Communication for Development Approach
to Scientific Training and Research**

and its extension

**Digital Transformations: Seeking Applied
Frameworks and Indicators**

IDRC File: 105127-001

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ORBICOM, Montreal

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Synthesis

The systematic quantification of the ICT sector, with detailed and integrated statistics, has produced valuable insights for policy interventions in developed countries. However, the quantification of the sector had not been attempted in southern countries.

As digitization increasingly blurs industrial boundaries, the ICT sector with its vertical integration of manufacturing and services industries provides a springboard for a more substantive dialogue across jurisdictions within countries. It expands the scope of ICT research, leads to a more comprehensive examination of national strengths and weaknesses and, in the process, necessitates that key stakeholders work together, such as the regulator, the departments of finance, human resources, S&T, trade etc. It can bring together a wider audience of policymakers by demonstrating the "bigger picture" context.

The project objectives were to:

- Quantify the ICT sector and produce both aggregate and detailed, cross-industry and time series data as per the internationally agreed-upon OECD definition, as well as identify the data sources and/or gaps and limitations.
- Assist capacity building between National Statistical Offices and researchers, and do so in a collaborative manner that creates and nurtures opportunities among them forging long-lasting and mutually beneficial research ties.
- Produce and disseminate policy-relevant analysis based on the data in a way that encourages multi-stakeholder policy dialogue.

Five countries participated in the project, Cameroon and Egypt from Africa, India and Malaysia from Asia and Brazil from Latin America. Research teams were formed between the national statistical authorities and lead and associate researchers. These were supported by the scientific director. One of the first tasks involved was the development of concordances between the national industrial classification used and ISIC-based international definition of the ICT sector. The statistical compilations were the responsibility of the NSOs, while the policy-oriented analysis that of the researchers.

The project was successfully completed within the planned timeline in all five countries[1] and obtained significant results. The magnitude and the evolution of the ICT sector in each country were profiled for the first time, both in terms of GDP and employment. The revealed national strengths and areas that would benefit from policy interventions were critically analyzed. All reports are published online (see www.orbicom.ca).

Considering the cross-cutting nature of the subject matter of the reports, which extends to international trade, R&D, and investment, the project is expected to have substantial impact among policymakers. In effect, this started during dissemination at WSIS 2011 through exchanges with policy makers. Additional impacts are expected as the reports diffuse widely, including internationally through UN publications.

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[1] See Annex 1 for a detailed account of the six-month period (January 2011-June 2011) in the project.

Research problem

In a period when ICTs proliferate and computers, cell phones and the Internet have permeated all industrial sectors, government institutions and households, it is fitting that stock is taken of national developments in individual countries. This is more so in light of significant asymmetries in the areas of ICT production, trade and consumption. While many countries are well-known producers of the hardware and peripheral equipment which has become emblematic of the digital era, others rely almost exclusively on imports. While some tend to specialize in manufacturing, others do so in services. It is therefore important to quantify the producing ICT sector in individual countries, and do so in a way that allows comparability across nations – that is using an internationally agreed-upon standard. This will provide the rationale for, and enable the customization of, national policies.

At the same time, the measurement of the ICT sector is quite important for many types of economic analyses, including those focusing on productivity. In fact, the ICT sector was in the heart of the so-called "productivity paradox" not too long ago, in the sense that while the superior productivity of the ICT sector was well established there were lingering questions as to whether or not such productivity benefits spill over to the rest of the economy and are thus conferring widespread benefits to the economy of a country.

Research findings

Quantifying the ICT sector in the participating countries of the South was undertaken for the first time. As a result, many new findings have come to light, particularly in regards to the size of the sector in terms of its contribution to value-added and employment, as well as its evolution in recent years. Among them:

The values of the ICT sector as a proportion of total GDP range from 2.5% in Cameroon to 9% in Malaysia in 2007. Expressed as a proportion of total business sector GDP, they become higher. In India, for instance for the same year, the ICT sector accounted for 5.9% of total GDP while its share in the value-added of the business sector was 7.4%. In Brazil, it was 3.6% but its share in business sector value-added was 5%. In general, the magnitude of the ICT sector in the countries of the project is within range of others. The average business sector share of the sector at the OECD was 8.5% in 2008.

The shares of employment were lower. They ranged from 2.1% of total business sector employment in Brazil to 7.3% in Malaysia. Being lower than their GDP shares, these employment shares point to higher productivity in the ICT sector than the economy at large. These results are consistent with those obtained in developed countries.

ICT services dominate the sector in India and Egypt, due to software and telecoms, respectively, while manufacturing continues to account for the bulk of the sector in Malaysia, despite a recent slowdown. The sector is characterized by above-average

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growth. Moreover, it accounts for much of the industrial R&D and is more innovative than the rest of the economy.

In general, the ICT sector workforce is younger, more educated and better paid. Women, though, are at a disadvantage – with the exception of lower-pay occupations.

All the detailed findings of the project are in the reports released publicly.

Fulfilment of objectives

The quantification of the ICT sector in the participating countries was achieved as planned. Cross sectional and time series data were produced, in concordance with the international definition. Data were compiled for the sector, its relative shares in GDP and employment (total and business sector), as well as industrial breakdowns. Moreover, the evolution of the sector was tracked, and other issues such as trade, investment and innovation were quantified in countries where it was possible.

Capacity goals were greatly achieved, more than initially envisaged. Surely the associate researchers benefitted from interacting with the lead researchers and the NSOs, improving both their knowledge of data sources, processes and timelines and their networking. Moreover, for countries such as Cameroon the project was a significant learning experience and brought together many stakeholders in the country to think together. This was capacity building too. The early workshop with all countries went a long way towards improving researcher and NSO capacity. They kept open the dialogue and communication channels throughout the duration of the project, and the ties that were built between researchers and NSO officials as well as among researchers will last long. The presence of the associate researchers in the project, and their role particularly in the analytical phase, did aid the capacity of younger researchers to undertake similar research in the future as they gained valuable subject-matter expertise and were exposed to the workings of the project.

The policy analyses were also produced as planned. The final reports contain in-depth analysis of the national landscapes, an examination of national policies to date, as well as the groundwork necessary for more customized policies in the future.

Project design and implementation

The design of the project involved an initial country or regional workshop for the training of the lead researchers, which would subsequently work closely with the NSOs. Early in the project, and due to requests by all involved, a much bigger event was organized with the simultaneous participation of all researchers and NSOs. The event proved quite successful in forging a common understanding between researchers and NSOs in each country, which helped greatly afterwards when the project unfolded. Moreover, it helped crate unforeseen ties among researchers from different countries, which continued in the duration of the project leading to cross-fertilization of ideas and analytical techniques.

The only disappointment during the implementation of the project was the withdrawal of Argentina. Due to internal problems at the statistical office they could not continue after the initial phase. While every effort was made, it was simply not possible for them.

Project outputs and dissemination

The outputs of the project are considered quite substantial. Thorough individual reports were produced in each country, as well as an additional standalone report synthesizing the findings across the five countries, and providing comparative analysis with other countries. In summary, the following reports have been produced and made public:

- India and Malaysia's reports were published online on Feb. 8, 2011
- Egypt and Cameroon's final reports were published online on March 23, 2011
- Brazil's final report was published online in early May 2011.
- Synthesis Report of the 5 country reports was published online in June 2011.

Published reports can be accessed online or downloaded from Orbicom's website at: http://www.orbicom.ca/index.php?option=com_content&task=view&id=1191&Itemid=1 191.

Through a combination of outside interest and promotional activities by Orbicom, country research teams participated and presented their work in the following events:

- India and Malaysia, UN Global event, Seoul, South Korea, July 2010
- Brazil, ECLAC regional event, Montevideo, Uruguay, September 2011
- All, WSIS 2011, Geneva, Switzerland, May 2011

Capacity building

In addition to its contribution on the specific subject-matter area of the ICT sector, the project contributed significantly to capacity building as well. In fact, the capacity building contribution of the project manifested itself in different dimensions.

First, the lead researchers broadened their capacity by really becoming specialists in the detailed matters of the ICT sector, including matters of national and international classifications and their concordances, data sources, uses and limitations, as well as areas for proposed statistical improvements. This will situate them well for future projects.

Second, NSOs benefited through their officials and the general conduct of the projects. Taking on this challenge, they got a boost in their confidence while feeling they have the needed support to go the distance. This was particularly true in the case of India, where they prepared their own standalone publication with evident pride. Moreover, they participated in events with equal pride for their accomplishments.

Third, associate researchers worked closely with the lead researchers, particularly in the preparation of the final reports. It was a great experience for them to follow such a project and see it to completion as well as co-author the final reports.

It must be noted that three of the five lead researchers were women. As well, two of the associate researchers and five of the nine NSO officials who participated in the project were women.

Project management

The administration team of Orbicom, inside UQAM, has many years of experience on project management, which came to bear in this project. All organizational matters, recruitment of NSOs and researchers for participating countries, signing of MOUs, contracts and the like were handled very efficiently. Moreover, all logistical arrangements for the workshop and the participation in international events were handled competently and professionally.

On the subject-matter, country research teams, particularly the lead researchers, were continuously in contact with the scientific director where they discussed at length every issue that arose and required decisions to be made. Moreover, they were given access to the latest material internationally so they were kept abreast of recent developments.

Throughput the lifetime of the project, our cooperation with IDRC was outstanding. Orbicom gave a heads-up on everything that happened in the project and solicited the opinions of the project officer. Everything went very well, to the satisfaction of all.

Impact

All reports have already attracted a considerable amount of attention, both nationally and internationally. It is justifiably expected that they will have much more impact later, and they will be seen as the definitive reports in this area for their countries. The public release of the reports also resulted in invitations for dissemination. In fact, these started before the finalization of the work and the public release of the reports. In terms of reach this project has already been more successful than initially envisaged. It has been embraced by UN organizations, particularly UNCTAD and the International Partnership on Measuring ICTs for Development. Moreover, it has already been quite influential in Latin America through ECLAC. Its reach has not yet been fully extended, as the finalization and public release of the reports is quite recent. Therefore, it is expected to intensify.

In terms of impact on policy it is too early to tell. There are, however, several layers to this. First, at the level of the existing inertia among statistical authorities to embark on projects for new statistics, this project has definitely had quite an impact – and this is especially true in the case of India. Then, there has been contact between researchers and ministers at the Geneva WSIS but much more is needed. As the report diffuses more

widely within the countries, and as it is picked up be different jurisdictions, only then we can assess the impact at the policy level.

The project did generate a fair amount of new and specialized knowledge. This will be diffused even more, e.g. through UNCTAD's annual report on the Information Economy.

Overall assessment

All in all, this project succeeded in its objectives. Its design was the appropriate one for the particular project. Considering the nature of the variables required for the quantification of the ICT sector, it could not have been accomplished by researchers alone. The presence of the NSOs was required. At the same time, the NSO would not have embarked in such a project without the outside interest and support, and the knowledge that the statistical compilation will be used for policy analysis. In that sense, the bridging mechanism that was attempted and used in this project worked well.

It must be said that this project was very well defined – if narrow. This is deemed to have helped, as it left no room for ambiguities of the open-ended variety.

Needless to say, the implementation of the project and the individual experiences were not uniform across all countries. Generally, the Asian countries showed much more zeal. The quality of the lead researchers and their dedication to the project were major contributing factors. The same is true for the commitment of the NSOs, with the primary example being MOSPI in India; following a slow start, they really took ownership of the project and also produced their own publication. The Brazilian researcher went out of her way to complement the analytical usefulness of the project with numerous sources of data, some of them of the microdata variety, which required extra effort. Egypt tried to get as much beyond telecoms as possible and then was caught in the regime change. For Cameroon the project represented an opportunity to bring together the various stakeholders in what is a fragmented landscape of information. Much more effort will be needed in future endeavours.

At the end of the project, there have been voices urging for more of the same in additional countries. While this project does not have such intention, to the extent that it will happen through other channels, the elements used in this project could prove very useful, particularly the collaboration between researchers and the NSOs.

Recommendations

Based on the experience of all aspects of this project, from beginning to the end, our recommendations are:

- Continue with collaborative projects of this nature. The built-in incentive structure with the marriage of knowledge that boosts the confidence of the NSOs and the guaranteed existence of demand for the statistical output in terms of producing policy analysis can serve well.
- Complement such schemes with the presence of subject-matter experts, dedicated to the project and where all researchers have direct access.
- In similar projects, incorporate from the very beginning a gathering with the simultaneous participation of all concerned, as it creates useful momentum.
- Keep up the relationships with regional and global organizations that can help secure high visibility in dissemination.

Project extension and additional recommendations

It was decided to extend the project for a few months but rather than attempting to do more work on the ICT sector, it was deemed more useful to conduct research that would be conducive to IDRC's new prospectus on Information and Networks. The objective of the project extension was to try and define future potential research frameworks, projects and indicators. The terms of reference are included in Annex IV. Three studies were commissioned under the overall umbrella of Digital Transformations, and a workshop of experts was held. The think-pieces produced are attached to the submission of this report. The agenda and participants to the workshop can be found in Annex V, together with the rapporteur's report.

An additional recommendation stemming from the project extension is:

- Continue to communicate with the authors/researchers through the Spring of 2012 with a view to further define and elaborate potential projects on:
    - Measurement and analysis of information capacity in countries
    - Networks and their characteristics

ANNEX I
PROGRESS REPORT: JANUARY 2011 – JUNE 2011
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Finalization of Individual Country Reports

The final phase of the project involved the completion of the Final Country Reports by the country research teams, including their online publication and the final dissemination of project results. The period from January to May became a very busy period for all project participants, as the work entered its final stretch.

All participating countries entered the final phase with a view to completing their final reports in all their fine details. It was well understood that, being technical in nature with many tables, charts, and annexes both subject-matter issues and the lay-out process would involve considerable back-and-forth between the lead researchers, the scientific director, as well as the production team. Naturally, the finalization process and the issues encountered were specific to each country report.

Asia: As indicated in *Interim Technical Report #5*, the New Year began with the submitted drafts of final reports from India and Malaysia. For both of these countries, an intensive period of editing took place on the subject-matter, the structure of the reports, and the sequence of presentation. These involved intensive exchanges between the scientific director and the authors. Moreover, issues of readability, including terminology and language, were addressed through additional editing and detailed exchanges with the lead authors. When all parties were pleased with the final draft, it then moved over to the final stage of processing and layout. The production team designed a common-look-and-feel for all reports, with particular attention paid to the clean-up or re-doing of tables and charts, proper referencing of sources, and their integration into the documents. Then the reports from the two Asian countries were published online as targeted, in February.

The same process was implemented for the country reports that followed.

Africa: In the cases of the African countries, the intention was to publish the reports from Egypt and Cameroon together towards the end of February. However, the finalization of these two reports and their online publication took place a little later than planned due to circumstances beyond anyone's control. In light of the situation of the uprising and the fall of the regime in Egypt, we lost communications with the lead researcher for a number of days. When online communication was back again, the lead researcher was experiencing, understandably, difficult times and needed more time to work on and deliver the necessary edits. Thus, the final review and finalizing process took much longer than anticipated.

In the case of Cameroon, we encountered a great deal of subject-matter issues that needed to be addressed before the final report assumed a shape worthy of publication. By necessity, this involved ongoing, intense and lengthy communications between the

scientific director and the lead researcher. Unavoidably, this caused some delays, which interfered with the planned timelines of the production phase. At the end, though, work for both Egypt and Cameroon was completed and the final reports were publicly released online in March.

South America: Brazil's working draft arrived in February, in Portuguese. Moreover, the report was very thorough but complicated in structure, with numerous sub-sections and a large number of annexes, including many and detailed tables that were referenced throughout the report. Following some initial exchanges with the author, arrangements were made to have Brazil's report translated from Portuguese to English. Considering the size of the report, and that it was filled with extensive text, tables, figures, and annexes it took longer to translate than anticipated. The files with the final translation arrived late in March. Despite having sought out a reputable translator with knowledge of ICTs, unfortunately, the interpretation of the text was poor and a great deal of effort had to be expensed by the scientific director and the production team to put the report into an English readable form that would be true to the authors' intentions. Moreover, all that had to be done in close consultations with the lead researcher. Further reviews by the author continued into April, and it took more time of constant liaising to arrive at the final product. A similar process was followed with the layout, which was labour-intensive. However, all was done to the satisfaction of those involved and Brazil's final report was published online early May. The timing was good as it was made public shortly before the Geneva WSIS.

Synthesis report: In parallel with the aforementioned activities concerning the individual country reports, the synthesis report with comparative findings from all country studies was being prepared throughout the winter. The work started with the early drafts for the countries that had supplied them, as well as with complementary information agreed upon between the author and the scientific director from other sources, such as OECD and UN reports. A detailed outline was drafted and adhered to. Upon completion of individual country reports, materials were finalized as appropriate.

Considering the relative delays in the African reports, there were analogous delays in the synthesis report. This became more evident in the case of Brazil - which incidentally contained a lot of excellent material for the synthesis report. However, much progress was made immediately after the editing of the translated material, that is, before the report was completely finalized with the author. The synthesis report highlighted important findings across all country reports, as well as offered comparable analysis with other countries that produce ICT sector statistics. Although it was not possible to release it online before the Geneva event, it was made publicly shortly afterwards.

As indicated above, the process of moving from working drafts to final and formatted reports worthy of online publication took much effort from all involved. The targeted deadlines for online publication were primarily achieved as planned, and are indicated below in the *Summary of Online Publications*.

Summary of Online Reports/Publications

- India and Malaysia's reports were published online on Feb. 8, 2011
- Egypt and Cameroon's final reports were published online on March 23, 2011
- Brazil's final report was published online in early May 2011.
- Synthesis Report of the major findings of the 5 country reports was published online in June 2011.

Published online reports can be accessed or downloaded from Orbicom's website at: http://www.orbicom.ca/index.php?option=com_content&task=view&id=1191&Itemid=1 191.

Final Dissemination of Project Outputs

With the achievement of online publication of all five final country reports by early May, the emphasis shifted to the final dissemination of the project's visible outputs.

As indicated in *Interim Technical Report #5*, we had as our final goal to end the final phase of the project with the dissemination of the project outputs at the WSIS 2011 event, which was held from 16-20 May 2011 in Geneva, Switzerland.

This global event attracted much attention and many participants. It offered a first-rate opportunity to promote all the work completed in an influential forum. In fact, considering the competition for time, there were only two sessions on indicators planned. One session was reserved by the organizers, the International Partnership on Measuring ICT for Development, to present a stocktaking of their recent activities. However, as there was not much of a concrete output to showcase, they asked that they co-organize the second session with Orbicom, on May 17. Orbicom was happy to oblige. Therefore, our participation assumed an even higher profile, and at the same time benefited from the Partnership's promotional efforts.

Logistic arrangements were made by Orbicom for all participants, including registrations, and travel arrangements. In addition, the presence of the entire team was well coordinated. Country lead researchers were asked to prepare presentation slides focusing on their major findings, which were consolidated and formatted in a single PowerPoint presentation for common look and feel.

The Partnership organized the event, inviting the Project Manager to open the session with an overview of the Orbicom-IDRC project, and the scientific director to moderate the discussion at the end of the session. All six researchers, the five lead country researchers and the author of the synthesis report, were included in the agenda (see Annex III, including a summary of the session prepared by the Partnership).

The presentations were received very well, and the project attracted significant praise. Moreover, they generated an animated discussion in their aftermath, with the emphasis on extending such a project to more countries. Colleagues from UNCTAD, in particular, praised IDRC and Orbicom for having undertaken such a worthy project and expressed their wish that more is done by other countries. In addition, they plan to include findings from the reports in their annual Information Economy publication.

Evaluation Activities

The evaluation process conducted by Ricardo Ramirez, which involved ongoing evaluation activities through each phase of the project, was also completed during this reporting period. The final evaluations for phase 3 entailed a new round of contacting the lead researchers/authors in each country and collecting additional inputs. A synthesis of the findings is contained in the final report submitted (see Annex II: Final Evaluation Report).

• Evaluation Report •

Statistical Compilation of the ICT sector and Policy Analysis

March 28, 2011

Ricardo Ramirez Communication Consulting

Executive summary

The main user of this evaluation is IDRC's ICT4D Unit where there will be interest in sharing the lessons and products emanating from this project. The main purpose of this evaluation is to learn and report on lessons learned and approaches that were pioneered. The key evaluation question focused on outcomes, though not exclusively as there were also relevant elements referring to process and methodology.

The rationale beyond this project proved to be sound. Donors' investments in research often yield meagre results – especially quantitative studies. In this case, at the end of Phase 2 the National Statistical Offices (NSOs), in collaboration with lead researchers, produced statistical results, including publications. So did the Researchers (Rs) at the end of Phase 3. Having these outputs in hand is significant. The rationale is that researchers want to use data, not produce it through surveys. Statistical offices, in turn, are willing to include researchers' demands in their data collection and compilation activities. The researchers put demands on the NSOs and they respond; the supply and demand sides are covered - the loop is complete.

This evaluation found that the relationships between the two parties, while at times awkward, developed into cordial and professional partnerships. This is not to say that there were not obstacles, and some remain. However, the strength of the linkages lies in individuals with renewed trust and understanding about the roles that each play and how they can help each other – how to avoid solitudes. This project emphasized 'knit-working' by playing the role of matchmaker. It built on networks of trust provided by the PIs, and it connected the champions across partner organizations. The matchmaking between each pair of research teams and national statistical offices was also the result of the investigators' patience and intense communication. There was lots of hand-holding at a distance, and little in the way of 'marriage counselling'; in other words, the rules were set from the start, time and flexibility were allowed, but each party had to develop relationships in their own terms.

The project created windows of opportunity; it funded the capacity development process and encouraged the NSOs and the research teams to publish their work, thus giving it visibility and credibility in each country. This evaluation includes evidence of changes in the attitudes and behaviours of statisticians and researchers alike, as well as some promising organizational shifts that may enable future collaboration. The continuity of these relationships rests on personal relationships and experiential learning. The project experience in creating bridges between ICT statistical supply and demand may provide lessons for other sectors. The project achievements have already recognized in the form of an invitation to present the findings during the 2011 WSIS meeting in Geneva.

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Introduction

Users and purpose

- The **main user** of this evaluation is IDRC's ICT4D Unit where there will be interest in sharing the lessons and products emanating from this project.
- George Sciadas and Pierre Giguère at Orbicom will benefit as Principal Investigators (PIs).
- The **main purpose** of this evaluation is summative: to learn and report on lessons and approaches.
- The **key evaluation question** focuses on documenting outcomes, though not exclusively as there are also relevant elements of process and methodology.

Methodology

This evaluation includes the following data collection tools:

- The **evaluator participated** in the full project meeting in Montreal and met the teams from each of the six participating countries (May 2009).
- A **baseline of perspectives** was collected from representatives of the National Statistical Offices (NSOs) and from the Researchers (Rs) during the Montreal workshop (May 2009).
- An **in-depth interview** was conducted with the Principal Investigators (PIs): George Sciadas and Pierre Giguère at Orbicom, UQAM (March 2010).
- **A second set of data was collected as each of the** Statistical Offices or Authorities completed **Phase 2** (summer 2010).
- **A second set of data was collected as each of** the Researchers completed **Phase 3** (fall-2010 to beginning of 2011).
- An end of the **project brief on outputs** was received from the PIs (March 2011)
- **Draft report** to the PIs for comments (March-April 2011).
- **Final report** (April 2011).

The PIs were consulted before data collection tools were applied to ensure relevance. They received summaries of the findings after the completion of each data collection effort.

Data analysis:

- The baseline for NSOs and for Rs were summarized separately.
- When the end of Phase II (NSOs) and III (Rs) were reached, a "Baseline_Final Table" was prepared per country on the basis of the first three questions.
- Each response was coded (naturalistic coding) by highlighting the key words or phrases.
- Once again, for NSOs and for Rs, a "Baseline+final Summary" was prepared, with quantified responses (based on coding) to questions #1-3, plus a quantified summary of responses to questions #4-7. These summaries are included in this report under the Achievement sections for NSOs and for Rs.

Findings

The rationale behind this project

Donors' investments in research often yield meagre results – especially quantitative studies. In this case, at the end of Phase 2 the National Statistical Offices (NSOs), in collaboration with lead researchers, produced statistical results, including publications. So did the Researchers (Rs) at the end of Phase 3. Having these outputs in hand is significant. The rationale is that researchers want to use data, not produce it through surveys. Statistical offices, in turn, are willing to include researchers' demands in their data collection and compilation activities. The researchers put demands on the NSOs and they respond; the supply and demand sides are covered - the loop is complete.

A no-single-model approach for in-country collaboration

There was no single model used to encourage in-country collaboration. The Principal Investigators (PIs) set the conditions: a lot of time invested, painstaking communication. After they set the conditions they let each country sort out the details. The key ingredients were:

- Allow time
- Adjust to each culture
- Explain with plenty of justification (letter of the law, no adventures)
- Lean on the strengths: who talks to whom first
- George Sciadas (one of the PIs) is recognized, he has weight, knows the material, plus he has developed personal linkages
- Pierre Giguère at Orbicom, the other PI, has a wide net of linkages that he could count on for support

The project sought to sign a Memorandum of Understanding (MoU) with each NSO. The PIs contacted each one and they in turn agreed to collaborate with local researchers. Each MoU was different. For example, India insisted that the payment went through the researchers (their rules did not allow NSOs to receive funds from NGO). In contrast, in Cameroon they wanted all the funds to come to them directly. This meant lots of legwork with the NSOs to explain the project. It is worth emphasizing that many of the lead researchers were instrumental in making the linkage work. The PIs explained: *"we took things to a certain level, and trusted that they work it out… we did not got there to make them love each other."*

Each case was unique: In India, the researcher (Dr. Payal) did a great job linking with the NSO. In the case of Brazil and Argentina both achieved MoUs with the

NSOs and then asked them to identify the R (the other way around from India). In Cameroon it also started via the lead R. In Egypt the Ministry could not sign directly for the NSO, they found an appropriate authority with responsibilities for ICT statistics to sign the MoU.

India worked particularly well. Their government is amazingly bureaucratic and very inflexible. The R team in India was the one pushing (Ms Payal) using all the channels (and they do have *many* levels….). It took a long time but it worked thanks to her. Once they had the MOU they excelled, they performed, they pushed the frontier, they are very proud, George was amazed at the tone – they are very proud and with reason.

Constant and detailed communication

George emphasized that "..in addition to setting the stage and allowing countries time and flexibility to sort it out, it was combined with constant and detailed communications – whether on the subject matter side or the organizational/admin side. As Rs and NSOs worked out details, they counted on non-stop back-and-forth with Pierre and myself, which they used in their dealings. Collectively, we must have written hundreds of pages worth of e-mail, as well as provided highly relevant material from other contexts as appropriate."

The Montreal workshop (May 2009)

The workshop brought all participants together; the very fact of having all country representatives around the same table made them feel part of a larger whole. It also underlined the emphasis on teamwork and sharing of experiences. In their feedback, many participants referred to it as a highlight of the project. One respondent suggested such a gathering could be replicated on a regional basis at the end of each phase.

The PIs commented that the initial plan was to only gather the researchers, and for them to link with the NSOs in each country. The idea of a full gathering came to them by popular demand and it gave the project momentum.   This event was not in the original proposal, it was a struggle to fund it. In future the PIs would do it again. They warn that the logistics were a challenge: too many individuals wanted to come, the money transfers were nerve racking.

Identification, selection and availability of key documents

The project subject matter is very contained. There is plenty of history, though it is rather new to the country partners. They joined the project because they were not doing work along those lines, or did not have an appreciation for it. Part of the pre-Montreal phase was to gather everything (exhaustive review) that was available (and also publications that came after). This was part of setting the

ground: making it all available (with actual copies on a dedicated website maintained by Orbicom until the end of the project[2]). This meant that the teams had a steep learning curve to climb; a substantial amount to cover (a major research challenge, with country specific adjustments). Had they been left on their own, they may have found the key documents or not, but with a significant investment in time[3].

The technical challenges fell within the expected

Problems were technical and very specific - as expected. The PIs never had any complaints. This was all known territory for George. A lot of effort was spent making sure they would be able to take this on. Where the starting level of achievement was low, the expectations were clear and set at the appropriate level.

The PIs have been careful not to be heavy on reporting: all of the focus remains on final publications. They did ask for a country plan developed by each R and NSO team. Ongoing adjustments were made as needed. They also asked for an interim report that made the level of progress evident. Each country team read each other's interim reports. There was little in terms of imposing reports: the purpose was not to impress Orbicom, but to produce publications and put them out for the public. The PIs would follow this approach again.

Pleasant surprises

The NSOs did not have a requirement to ask George for comments on their reports at the end of Phase 2. Therefore, George was surprised to see the India NSO consulted with him prior to publishing their own report. They felt they could do it; it was not part of the MoU. For George this is indicative that India is very proud of their achievement.

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[2] At the end of the project it will be made available to IDRC (references without PDFs due to copyright).

[3] George has lots of evidence that they used it; the level and nature of the feedback is indicative of which R are the keeners; he often put them in touch with other experts.

Achievements by the NSOs

Table1 summarizes the positive changes perceived by the NSOs at the end of Phases 1 (May 2009) and 2 (summer 2010).

Table 1. Positive changes from the project (# of responses).	
May 2009	Summer 2010
• Better understanding of ICT sector, indicators (6) • Learning from each other (4) • Progress on concordance classification (3) • Enhanced collaboration with research (1)	• Specific indicators, measurement, data sources, sector (4) • Exposure, expertise (3) • Concordance, compatibility (2) • Organizational strengthening (2) • Other: tracking ICT policies, linking to research (2)

There a consistent pattern from one year to another, with growing attention on specific measurement and indicators issues, along with acknowledgment of personal skill gains and organizational development.

Table 2 summarizes the challenges as perceived by the NSOs at the end of Phases 1 (May 2009) and 2 (summer 2010).

Table 2. Most significant challenged yet to be addressed (# of responses).	
May 2009	Summer 2010
• Classification, reclassification, estimating magnitude of ICT sector (5) • Operationalizing accounts, surveys, procedures, training, timetables (4) • Integrating concerns of many stakeholders (3) • ISIC Rev.4 adoption, dissemination (2) • Understanding trends (2)	• Indicators, measurement issues (5) • Data collection, changes to surveys, sustaining, aperture (5) • Other: national team, Montreal workshop; validate quality of data (3) • Classification, concordance (2)

Once again there is a consistent pattern from one year to another.

With regards to personal goals from one year to the next, Table 3 provides a summary of the responses obtained:

Table 3. Personal goals one year from now.	
March 2009	Summer 2010
Skills ▪ To have **skill** in analyzing data especially ICT data in terms of **methodology**, computer software. (For example, what is the best methodology to analyze those data? Productivity per worker.) **Concordance** ▪ A very clear **concordance established** between classifications. [CAM] ▪ In one year we should have the compiled data available, evaluated and **standardized** to ICI (ISIC?) 4. **Indicators** ▪ **ICT indicators** from 2005 to 2008, as much as possible. ▪ Validating and ensuring the **accuracy of ICT indicators** based on the international standards. **Portraying the ICT sector** ▪ To be in a better position for **commenting on growth of ICT sector** in terms of GDP and employment. **Other replies** - not worded as personal goals • About the 3rd phase of the project. ▪ The importance of the ICT services.	**Skills, knowledge, leadership** ▪ To a great extent I shared the **knowledge and best practices** with the other involved countries in the field of ICT measurement and concordance between ISIC REV. 3.1 and ISIC Rev. 4. ▪ The experience of **being the leader** of a new project; the **knowledge acquired** about the subject matter; **living the work experience**, which involved national and international professionals. **Indicators** ▪ I succeeded in developing a new list of ICT economic indicators that reveal the relative importance of ICT sector within the Egyptian economy and other services sectors. ▪ The **main indicators were calculated**, value added were somehow easy, but employment was difficult and we have it only on telecommunication branch; we stay in the spirit of the project, that means to **address the goals by data available without going to the field for data collection**. In brief push frontier as far as possible to achieve the goals of the project. **Concordance and indicators** ▪ **Development of concordance** of ISIC Rev.4 with NIC-2004, NIC-1998 to bring consistency in the data which have been compiled following these two; compilation of the **contribution of organised ICT manufacturing sector;** compilation of the **contribution of ICT**

	Services Sector through NSSO survey could be achieved only for one point of time. The objectives were not achieved due to changes in organizational priorities (Argentina).

There is a consistent pattern from one year to another, with India exhibiting the completion of their objectives concretely, and others demonstrating a growing level of expertise and understanding (Cameroon, Egypt). Argentina was unable to complete the objectives due to a lack of organizational commitment.

When the NSOs were asked to list what specific changes they would incorporate in the way they will personally conduct their work from now on, the following groups of responses were received (# of responses in each group):

- Developing ICT indicators, measuring, change/additions to surveys (5)
- Other: the way I conduct internal / external working groups; sharing with colleagues; revised internal procedures (3)
- New: measuring ICT policy impact, producing new publications (2)
- Internal problems with goal setting and procedural review (1)
- Concordance issues (1)

When asked to what extent the project had changed the organizational outlook the following groups of responses were received (# of responses in each group):

- Releasing diversified reports widely used by research; opportunity to talk about ICT sector, develop synergy with research (3)
- Now collecting ICT demand by businesses and by households (2)
- It increased the relevance of the subject matter, along with the inadequate allocation of resources (1)
- Mobilization of professionals (1)

Achievements by the NSOs

Table 4 summarizes the positive changes perceived by the Researchers at the end of Phases 1 (May 2009) and 3 (fall of 2010 to winter of 2011).

4. POSITIVE changes from the project (# of responses).	
March 2009	Fall 2010 to Winter 2011
• Quantifying sector using international standards, deeper understanding of ICT indicators (5) • Linking with policy analysis and	• Measuring ICT sector and impacts of related polies (5) • Created linkages with NSOs (often with difficulties) and understanding

formulation; action research (4) • Compiling and disseminating ICT sector data; skills to communicate with gov. officials (3) • Interaction with other countries (2)	(4) • Harmonized analyses of sector (2) • Skills and confidence increased (2) • Becoming a role model (eg for tourism sector (1) • Now have a team (1)

There is a consistent pattern with emphasis on measuring and linking with NSOs and other policy processes. Increases in skills and confidence also noted at the end of Phase III.

Table 5 summarizes the challenges as perceived by the Researchers at the end of Phases 1 (May 2009) and 3 (fall of 2010 to winter of 2011).

5. Most significant CHALLENGES yet to be addressed (# of responses).	
March 2009	Fall 2010
• Reviewing, validating, adopting methodologies and aggregating ICT indicators (3) • Creating awareness about international standard classifications among private sector and policy makers (2) • Lack of standards for outsourcing; including new age industries (2) • Bring all stakeholders together, co-operation with partners (2) • Keep the same level of energy, sustaining project (2) • Dissemination in country • Focus on policy analysis • Compatibility of data among selected countries	• Establish/maintain closer relations with policy making, with NSOs (5) • Obtain up to date data that is reliable (3) • Measure value added of some ICT sub-sectors, of out-sourced activities and ICT innovation (2) • Raise awareness by private sector players both for them to use and provide data (2)

There is a consistent pattern, with a shift from achieving relations with NOs and policy making processes, to maintaining those relations and improving data access that is reliable.

Table 6 summarizes the personal goals as perceived by the Researchers at the end of Phases 1 (May 2009) and 3 (fall of 2010 to winter of 2011).

6. Personal GOAL one year from now:	
March 2009	Fall 2010
Skills	**Skills and understanding**

• Learning from the other country experiences, as well as the knowledge of the ORBICOM experts **Concordance & indicators** • Successes and challenge in getting ICT sector classifications adopted • Instituting a process that was not there before. • ICT has been recognized as a distinct economic sector, as the country is a producer of ICT products and services. **Portraying the ICT sector/ project goals** • Successful realization of 3rd phase • Overcoming an exciting challenge **Other replies** • Becoming a specialist in measuring this sector • Improve the level of development in our country on the basis of this new information	• Learning from other countries. • Deeper understanding of sources and methodology, and of classification systems. • Interest in taking the skills further and publishing. **Project goals** • Satisfaction in completing the project. • Training young researchers. • Having acquired ICT productivity statistics that was not in the original plan. • Planning to get ICT time series data to study dynamics of the ICT sector. **Other replies** • Learning from other country experiences.

A great deal of satisfaction was expressed at having completed a challenging process, with evidence of renewed interest in making use of the acquired skills.

When the Researchers were asked to list what specific changes they would incorporate in the way they will personally conduct their work from now on, the following groups of responses were received (# of responses in each group):

• Skills and confidence to intervene in statistical processes (how surveys are done); use more data for demonstration purposes, become more data sensitive and critical when reading publications (3)
• Focus more on data analysis for the benefit of policy makers; bridge the gap between the mainstream and industry players (3)
• Increase outreach efforts to bring policy making and research closer together, increase data dissemination to national ICT association, regularize a comprehensive ICT publication (3)
• Create teams and do more team work, communicate more clearly about difficulties encountered (3)

When asked to what extent the project had changed the organizational outlook the following groups of responses were received (# of responses in each group):

- The project created a bridge between researchers and NSOs. The project helped bridge the gap between public and private sector understanding and hopefully they speak the (same) language when policy dialogues and interventions are undertaken. (4)

- The project helped to create awareness about the emerging ICT data needs and demands, not only from the industry perspective but also its impact on society, economy, households and individuals. The project also helped us acknowledge private sector users. (2)
- A value added and additional achievement to my organization in the area of measuring the impact of ICT policies on the overall sector performance. (1)

Comparing NSO and Researchers' feedback

Table 7 compares the specific changes that NSOs and Researchers would incorporate in the way they will personally conduct their work from now on,

7. Specific changes NSOs and Researchers would incorporate (# of responses).	
NSO responses at end of Phase 2	Researchers' responses at end of Phase 3
• **Developing ICT indicators, measuring, change/additions to surveys** (5) • Other: the way I conduct internal / external **working groups; sharing with colleagues**; revised internal procedures (3) • New: measuring **ICT policy impact, producing new publications** (2) • Internal problems with goal setting and procedural review (1) • **Concordance issues** (1)	• **Skills and confidence** to intervene in statistical processes (how surveys are done); use more data for demonstration purposes, become more data sensitive and critical when reading publications (3) • **Focus more on data analysis for the benefit of policy makers**; bridge the gap between the mainstream and industry players (3) • **Increase outreach efforts** to bring policy making and research closer together, increase data dissemination to national ICT association, regularize a comprehensive ICT publication (3) • **Create teams** and do more team work, communicate more clearly about difficulties encountered (3)

Both parties demonstrated: a renewed interest in improving data collection procedures, a commitment to more outreach to bridge the gap between research and policy making, and more efforts towards developing teams.   This alignment is indicative of improved relationships.

Table 8 compares the extent to which the project changed the organizational outlook.

8. Changes in organizational outlook (# of responses).	
NSO responses at end of Phase 2	Researchers' responses at end of Phase 3
• **Releasing diversified reports widely used by research**; opportunity to talk about ICT sector, develop synergy with research (3) • Now collecting ICT demand by businesses and by households (2) • **It increased the relevance of the subject matter,** along with the inadequate allocation of resources (1) • Mobilization of professionals (1)	• **The project created a bridge** between researchers and NSOs. The project helped bridge the gap between public and private sector understanding and hopefully they speak the (same) language when policy dialogues and interventions are undertaken. (4) • **The project helped to create an awareness about the emerging ICT data needs and demands**, not only from industry perspective but also its impact on society, economy, households and individuals. The project also helped us acknowledge private sector users. (2) • A value added and additional achievement to my organization in the area of measuring the impact of ICT policies on the overall sector performance. (1)

Both parties recognized the importance of making data available among ICT stakeholders; they both recognized how awareness was elevated on ICTs, and how more linkages with the business community were generated and necessary.

Evidence of new relationships

The following are anecdotes that illustrate the kinds of relationship that the project helped create.

"Initial relationship was tough but as the project gathered steam and the technical details were discussed it was a more cordial relationship. The bureaucrats working in the statistical department found it difficult to follow the team leader's (who was from outside the bureaucratic system) work plan. The Researcher on the other hand found it difficult initially to adjust to the government functioning. However, friendship and mutual trust is important which developed over the course of the project. So much so, at the end of the project we also went shopping together at a conference, which we did not at the beginning of the project!"

"The NSO came on board to collaborate with me on this project on a 'good will basis' because I was ex-statistician in the Department. Otherwise, the formal procedure requires the official approval from the [unit/person] who oversees the NSO."

"Currently, I am working for [__], which as highlighted earlier, poised as a "voice of the industry". This means, [__ is] compelled to undertake policy dialogues and interventions with the mainstream agencies including [the NSO]. As acknowledged, such policy advocacies and interventions, sometimes, can be construed negatively or regarded as "negative criticism". In such a situation, "damage control" has to be done to avoid any detrimental effects to the project. In particular, [__] has been "aggressively" voicing out on the lack of comprehensive ICT data in the country, despite being long-time promulgators of ICT driven knowledge based economy. Though such policy remarks were made in good faith, still affected the working relationship with [the NSO] to some extent! Indeed, it requires a lot of tact and diplomacy as well as understanding to embark such projects."

"The other struggle that I faced in the conduct of this project is to get the data on time. In fact, the data in the NSO are highly computerized and organized at least in the recent years. Nevertheless, it took a while after sending a few reminders via e-mail to get those ICT data at five-digit level. Some of the communications were made not only with the project officers but also with the senior management staff, yet the response was slow. This may be due exigencies of work. In the case of [my country] experience, the project officer in-charge of ICT services statistics was on maternity leave for one and half months. Change of officer also posed problem and delayed the project completion."

"I can say that we have a good personal and friendly relationship although no particular events come to mind."

"The project kicked off at a moment a book was making headlines in France: " Le Grand Truccage: Comment le gouvernement manipule les statistiques" (The Big Trick: How the government manipulates statistics). I was wondering how the statistical office will manipulate data about ICTs. I got the response during the

sharing workshop. The Hotel was filled by statisticians coming from various organizations (Ministries, Regulators, Operators, etc). At a moment, it was like Babylon Tower. On the same subject, they were talking different language. Despite all my efforts, I was unsuccessful in getting agreement. So, any time I cross path with one of them of my team from the statistical Office, I ask if they have finally reached an agreement. Since then I am more sensitive to the use of data by politicians. In one of his last speech, the [country] Head of State stated that the level of unemployment in the country was less than 5%. In a country where less than 30% of work force is employed, the statement was treated by journalists as an insult to the poor jobless. I ran again to the statistical office to see how they could provide such statistics. They explain to me with the seriousness of statisticians that they apply the definition of the ILO to [this country's] situation. When asked where they store the statistics of people looking for job the last six months, the answer was, they don't have such statistics. They rely on the Ministry of Labor, which has no statistician."

Conclusions and recommendations

Bridging solitudes

At the time of our interview (half-way into the project in March 2010), George and Pierre felt the project was in a good position to achieve its purpose: bridging the solitude between the NSO and R communities in each country. Appendix D provides a summary of the outputs (reports) produced by the project, an indication that the PI's expectations were largely met.

In the "Outcome Mapping" approach this would suggest that their "expect to see" level of outcome was likely to be met. A more ambitious "like to see" level would be a core group of influential people in NSOs and R who know each other and keep on collaborating as a team. The real test will be how they will act next time there is a researcher leaning on the NSO instead of doing a survey of their own. Lastly, a "love to see" or ideal level of outcome would be when there are associated researchers also affected, networks expanded, and signs of institutional change. In other words, when change goes beyond the individual experience and makes a twist in institutional culture (such as researchers no longer feeling intimidated by statistical offices - a very common complaint).

While this evaluation report includes evidence of "like to see" outcomes, it will be interesting to confirm whether such changes are long-lasting. For example, the Indian researcher (Dr. Payal) is currently doing a project on R&D for EU, and she is now making use of the NSO thanks to this project. This is an example beyond the ICT world.

Country selection was time consuming (experiences worth avoiding)

The project document criteria for country selection were simple: they had to *want* to do it, and that they *be able* to do it. These criteria then needed some further attention; for example when they contacted Colombia they were very interested (very excited) but later they realized they could not do it (due to lack of data) and would not acknowledge it.   Cameroon, in contrast realized they had lots to learn, and humbly accepted the challenge. The fact that Argentina did not complete the project demonstrates the challenges involved in securing commitments from large bureaucratic organizations where other directives may override earlier commitment. Still, the project succeeded in having 5 countries complete all steps and publish reports that would otherwise not have existed.

The PIs allowed for each situation to evolve. In cases there were long delays. India took a long time, and then they performed best. Brazil looked easy at the start but then they did not work as well as India; they did the minimum. Some delays had to do with the bureaucratic processes involved in signing on high-level authorities. The PIs left room for each team to sort out the specifics. This meant allowing for six different time schedules that fit specific phases but not necessarily prescribed dates.

IDRC tried to help in good faith but their engagement slowed things down. They wanted to have people from other networks especially in Africa (Rwanda, Angola, Mozambique) but unfortunately none of them showed real interest. The principle was not bad, but the process was time consuming. Having said that, in other cases the IDRC support proved very helpful (the case of Egypt where Pierre also had good contacts and the IDRC regional office was committed to help).

Recommendations from NSOs about the future

When NSOs were asked to suggest recommendations about how this project could be improved if replicated in other countries in their region, the following groups of responses were received (# of responses in each group):

- **Organizational and resources**: suggest the NSO to put in place [an] internal work team that take to account [of] national account and classification personnel; stakeholder ministries and other organizations should be involved in the project as a country team; may provide resources for conducting a special survey on ICT sector (3)
- **Capacity building**: concentrate more on capacity building in the area of measuring broadband uptake; active interaction with the consultant on the data provided and the way forward in ICT statistics; may provide training for skill development (3)

- **Project scope and activities**: include a larger number of countries; promote regional meetings at the end of each phase (2)
- **Other:** the collaboration with lead researcher was beneficial because he is free of administrative process and this has helped advance the work; explore a small data collection to complete existent data; become familiarized with the different perspectives and determine objectives that can be measured (3)

The NSO's emphasized the importance of the kind of relationship they now have with researchers:

- "It was a very close and friendly relationship because: the researcher leader had worked at IBGE previously; the agreement about the deadlines had had to take into consideration the institution culture and human resources available to accomplish the phase 2; the fact of the knowledge level shared between the groups being very close to equivalent."
- "The conversations between researcher and NSO are done regularly through email and discussion."
- "A great pressure from the lead researcher, because all his mails were sent directly to the General Manager and I was copied; the determination of the lead researcher to achieve the goals of the project; sometimes, very hard and constructive discussion between me and him about the comprehension of the goals and spirit of the project."
- "The Lead Researcher took lot of interest in taking up this project and also encouraged MOS&PI to agree for the project. In fact, MOS&PI was hesitating to take up this project due to non-availability of data."
- We could list a number of difficulties faced with public sector organizations' expectations for data with disregard for clear and measurable objectives and resource allocations. In other words, they expect to harvest without planting.
- On the other hand it is more rewarding to share out experiences with groups like R.E.D.E.S. or with the University of Quilmes (Lic. Diana Suarez, Lic Gustavo Lugones) with whom we have enjoyed an excellent learning exchange since 1998 on matching research needs with statistics. Today the researchers are able to access information that is relevant to them while the Institute gains advice on the state of the art of ICT indicators that it would otherwise not be able to afford on a regular basis.

Recommendations from Researchers about the future

When Researchers were asked to suggest recommendations about how this project could be improved if replicated in other countries in your region, the following groups of responses were received (# of responses in each group):

- **Capacity building.** One research team proposed a technical workshop on meta data prior to beginning of work. They felt this would help in deciding definitions, the limitations and the possibilities for compiling data. Another team suggested more time for pre-project preparation. Yet, another team recommend to include a new phase in the project for **capacity building** through presenting best practices of different countries in areas like:
  - o Developing input-output tables that include ICT sector as a separate sector.
  - o Measuring the impact of ICT on services sectors like health and education.
  - o Impact of ICT on the overall economy.

- **Engaging NSOs.** The buy in of the statistical office is very important to replicate this work, so a greater commitment from the statistical office will improve the results. Since it involves a number of statistical staff, some kind of incentives needs to be arranged to get better cooperation from other member staff. It is imperative for the chief of statistical agency to give an undertaking letter on their commitment. In Latin American countries, it seems to me that the NSOs are still too closed to outside researchers. Although there have been significant changes, with international organizations' help and support (such as Partnership on Measuring ICT for Development, CEPAL/OSILAC and the IDRC itself), much remains to be done.

- **Project implementation.** One team commented that "Orbicom under the auspicious leadership of Mr. Pierre and Dr George Sciadas has planned out and implemented the project very well especially a lot of details have been given from onset on the project nuances, expectations and aspirations. In the case of Malaysia, some leeway was also given to work on the project on "mutual understanding, cooperation and collaboration basis" between the researchers and DOSM, opposed to "duly signed" agreement. Such flexibility and institutional arrangements are imperative to meet some of the national conditions and requirements.

- **Engaging more researchers.** "The ICT sector is diverse in nature. Primarily, it constitutes the production, services (computer and telecommunications), impact elements on society and economy. It is quite a formidable task to identify an ICT expert well-versed in all these aspects. Therefore, the project needs to have some flexibility and resource allocation to engage more than one associate researcher." The project team requires not only the involvement of ICT production statistician and ICT services statistics statistician but also:-
  - o National Account ICT statistician who computes share of ICT to GDP;
  - o Balance of Payment statistician who estimates the export and import of ICT services;

- o Trade statistician for providing the export and import of ICT merchandized goods;
- o Labour Force Survey statistician who collects and collates the "ICT workforce" information;
- o Basic Household Amenities Survey statistician who collates diffusion of ICT at household level

- **Showcase the project.** Share the outcome to as many meetings as possible in the region. For Africa, there are high level encounters in Dakar, Nigeria, Kenya and South Africa. Those can be golden opportunities to showcase the outcomes of the project, and build connection with research networks. Set up a web site dedicated to the project.

- **Continuity.** One team wondered about scaling up the project, (though it was not clear whether they referred to additional countries covered, or a longer length of project-supported activities).

Significance of outcomes in terms of policy influence

This project set out to bridge the gap between the supply side of ICT data (as collected, analyzed using current classifications, and published by national statistical offices) and the demand side (as required by researchers seeking to produce findings of interest to policy making). This meant that each side needed to understand the needs and procedures of the other. The two solitudes were reduced through a project-enabled partnership. This evaluation includes evidence of changes in the attitudes and behaviours of statisticians and researchers alike, as well as some promising organizational shifts that may enable future collaboration.

> "There is a very wide variety of activities to influence policy. One way to categorise them is to distinguish between approaches that take the 'inside track', working closely with decision-makers, versus 'outside track' approaches that seek to influence change through pressure and confrontation. There is also a distinction between approaches that are led by evidence and research versus those that involve, primarily, values and interests. This marks out four possible approaches to policy influencing." (Jones, 2011: 3)

Appendix E provides the summary of Jones' policy influencing approaches and a typology of policy influencing activities. Since this project worked closely with the two parties (it took the 'inside track' in Jones' classification) and was evidence and science based (it used ICT data and the latest classification protocols), it

belongs to the "advising" type of approach. In Jones' framework, the influence takes place through evidence and advice in the form of national and international policy debates (the Montreal gathering), and through formal and informal meetings among the parties. The means utilized include advisory support and coaching by the PIs, developing and piloting new approaches. The evidence exists both in terms of outputs (publications) and outcomes in the form of new relationships, skills, confidence and commitments for further collaboration beyond the project.

Sumner et al. (2009) emphasize that the meanings of research impact and influence are multiple, and that there is not single recipe for success. They suggest, however, that some key ingredients can increase the leverage of impact:

"Factors that support research greater impact and influence include:
- 'Sticky messaging' or 'rallying ideas' in the content and processes of knowledge generation and translation that play a role in whether research is acted upon.
- 'Knit-working' or the networking and building of coalitions of 'connectors' and 'champions' around ideas that lead to change.
- 'Strategic opportunism' or the role of mapping contexts to identify windows of opportunity for impact/influence (not forgetting the role of serendipity!)." (Sumner et al., 2009: 36)

Appendix F includes a graphic that summarizes how the three components overlap. This project emphasized the second component, 'knit-working' by playing the role of matchmaker. It built on networks of trust provided by the PIs, and it connected the champions across partner organizations. Second, instead of seeking 'strategic opportunism', the project created windows of opportunity. It funded the capacity development process and encouraged the NSOs and the research teams to publish their work (see report list in Appendix D), thus giving it visibility and credibility in country and in global ICT4D circles.

Project recognition in international fora and publications

Following regional presentations in Asia and Latin America, the Principal Investigators have been invited to make a project presentation during WSIS 2011 in Geneva (May, 2011). The PIs shared that news that Orbicom's session will last 90 minutes and will take place on the second afternoon of the conference. George Sciadas mentioned that the UN bodies are very interested in the outputs of this project and that UNCTAD will include findings in their annual Information Economy report.

Appendices

A. Baseline form

• Evaluation Baseline •

Purpose: The information collected through this form will contribute to the design of an evaluation process for the project. All information inputs will be anonymous: the data provided will be kept separate from the identity of the provider.

Over the last few months leading to this meeting…

1. What have been the THREE most significant POSITIVE changes that this project has stimulated in your work?

    ▪

    ▪

    ▪

2. What would be the THREE most significant CHALLENGES that remain to be addressed?

    ▪

    ▪

    ▪

3. If I were to interview you ONE YEAR from now, what single PERSONAL GOAL should I ask you to report on?

B. PI Interview Guide

Purpose and user

1. Who is the **main user** of this evaluation?
Who are the other users or audiences?
In what format should the report be prepared?

2. What is the main **purpose** of this evaluation? Accountability; learning (summative); or planning (summative).

3. Can you suggest a few **key evaluation questions** in any of the following?
- Accountability
- Outcomes
- Impact
- Process and methodology
- Other?

Process thus far

As project managers, if you were to replicate this project, suggest:

- 3 things you would do again (because they worked)
- 3 things you would abandon (because the results were disappointing)
- 3 things you would add (because you discovered them along the way)

Achievement by the statistical offices (close to / completed)
Level of satisfaction, what is missing, what were the surprises?

Achievement by the researchers (in course)
Sense of progress, what is missing, what were the surprises?

Achievements in collaboration within countries
Sense of progress, what is missing, what were the surprises?

Attached for reference are summaries of the baselines from May 2009 [not attached to final report].

C. End of Phase II and III sample form with notes on analysis

End of Phase II [or III] Questionnaire **Statistical Compilation of the ICT sector and Policy Analysis** Spring-Summer, 2010 or Fall 2010-Winter 2011	S/ R

• *country name* •

Purpose: This questionnaire form will be applied when each National Statistical Office or authority has completed Phase II. Once the form is received and analyzed, the evaluator may propose a brief, follow-up interview by phone or skype.

4. What have been the THREE MOST SIGNIFICANT CHANGES that the project stimulated in your work? For each one, EXPLAIN WHY the change is significant.

   ▪

   ▪

   ▪

ANALYSIS to follow
Compare each response to the Base Line [to show change per country]
Review and code the explanation; compare with Base Line tally [to show overall trends]
Prepare additional questions for phone interview [for more context]
Question 1 on "changes" reflects the attention on outcomes.

5. What were the THREE most significant CHALLENGES that still remain to be addressed at the end of Phase II?

   ▪

   ▪

   ▪

ANALYSIS to follow
Compare each response to the Base line and to the responses in Q1 [to show how far the project helped address the challenges they set for themselves]

Question 2 on "challenges" reflects the attention on the extent to which outcomes were achieved as perceived by each SO.

6. To what extent did you achieve the PERSONAL GOALS you set out in March 2009?

    ▪

    ▪

    ▪

ANALYSIS to follow
Compare with the baseline to verify if/how their personal goals may have shifted.

7. List up to three SPECIFIC CHANGES in the way you will personally conduct your work from now on. Explain why each one is significant.

    ▪

    ▪

    ▪

ANALYSIS to follow
Compare what they learned (skills, knowledge, confidence) with what they will practice / have already practiced as individuals.

8. To what extent has the project changed the ORGANIZATIONAL outlook?

ANALYSIS to follow
Document any suggestions or claims of broader change in organizational culture and their insight into what else would be needed to achieve such an ambitious goal.

9. Provide up to three RECOMMENDATIONS about how this project could be improved if replicated in other countries in your region.

ANALYSIS to follow
Document the lessons they have learned, verify the achievements as seen by the PIs.

10. List up to three EXAMPLES or ANECDOTES that illustrate the kind of relationship you now have with researchers. Be creative: share stories, anecdotes, email exchanges, or conversations that are memorable.

    ▪

    ▪

    ▪

ANALYSIS to follow
Document the lessons they have learned, verify the achievements as seen by the PIs. This is consistent with Most Significant Change approach where project participants are asked to recall critical incidents.

D. Summary of outputs (reports)

The visible outputs (reports) from the project were individual volumes for each country and a synthesis report. Each country report was entitled "Statistical Compilation of the ICT Sector and Policy Analysis: COUNTRY X". More specifically:

- INDIA: already released publicly on the Orbicom web site. The PIs considered this to be an excellent report and very successful collaboration between the research team and the statistical authority; they expect it to become THE reference document in this area internationally.
- MALAYSIA: also already released publicly on the Orbicom web site. The PIs considered this to be a truly remarkable report, the best ever statistical piece produced in this area in Malaysia. It contains a wealth of information and will be the definitive source for the ICT sector internationally.
- EGYPT: a decent report albeit not of the same calibre as the previous two - mostly due to the inability of the country to expand from telecoms to the full ICT sector and be fully compliant with international standards. Nevertheless, the PIs consider it to be a very useful piece of work, one that made the key players aware of the issue; it holds promise for future expansion. (All pending current changes in the country.)
- CAMEROON: a report that did more than was done before - also in close collaboration with the statistical office. From the very beginning, expectations were such that the project didn't aim for the complete quantification of the ICT sector; rather, it aimed more on awareness building among all key stakeholders in the country and capacity building. Both Egypt and Cameroon were released online by the end of March 2011.
- BRAZIL: another excellent report. The PIs consider it to be quite unique as it covers the ICT sector as envisaged as well as contains many other pertinent pieces of information and analysis. Again, they expect that it will serve as the key reference for Brazil internationally. The report was completed in Portuguese, and at the time of writing it was being translated into English for release in April.
- Synthesis report: a compilation of salient points and comparisons across the five participating countries, plus several other countries that have been covered by OECD and/or UNCTAD reports. At the time of writing the report was expected to be released in April 2011.

(Source: email from G. Sciadas 18 March 2011).

E. Policy influencing approaches

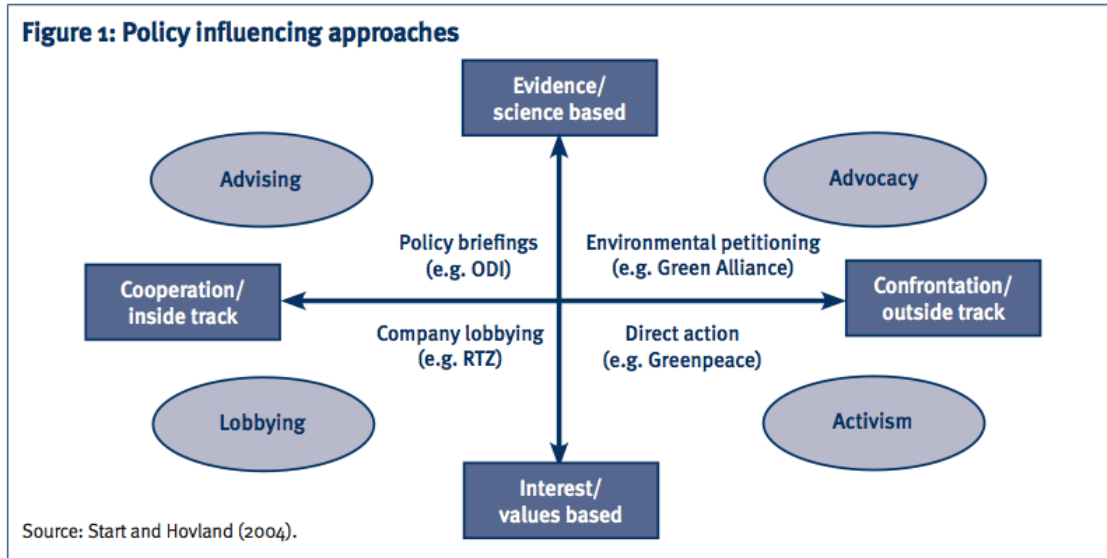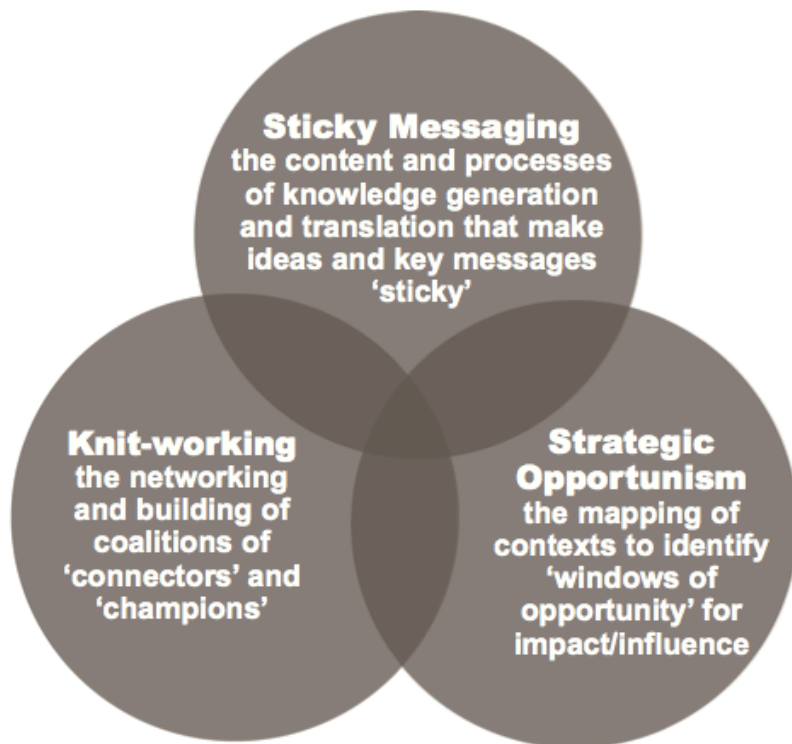Figure 1 and Table 1 (Jones, 2011: 2) summarize policy influencing approaches and activities.

Figure 1: Policy influencing approaches

Evidence/science based

Advising

Advocacy

Policy briefings (e.g. ODI)

Environmental petitioning (e.g. Green Alliance)

Cooperation/inside track

Confrontation/outside track

Company lobbying (e.g. RTZ)

Direct action (e.g. Greenpeace)

Lobbying

Activism

Interest/values based

Source: Start and Hovland (2004).

Table 1: Typology of influencing activities

Type of influencing	Where? Through what channels?	How? By what means?
Evidence and advice	• National and international policy discourses/debates • Formal and informal meetings	• Research and analysis, 'good practice' • Evidence-based argument • Providing advisory support • Developing and piloting new policy approaches
Public campaigns and advocacy	• Public and political debates in developing countries • Public meetings, speeches, presentations • Television, newspapers, radio and other media	• Public communications and campaigns • 'Public education' • Messaging • Advocacy
Lobbying and negotiation	• Formal meetings • Semi-formal and informal channels • Membership and participation in boards and committees	• Face-to-face meetings and discussions • Relationships and trust • Direct incentives and diplomacy

F. Ingredients to leverage the impact of research

Figure 5.1 (Sumner et al., 2009: 36) describes the three main ingredients to leverage the impact of research on policy.

Figure 5.1 Increasing the leverage of research for impact – ingredients of research influence

Sticky Messaging
the content and processes of knowledge generation and translation that make ideas and key messages 'sticky'

Knit-working
the networking and building of coalitions of 'connectors' and 'champions'

Strategic Opportunism
the mapping of contexts to identify 'windows of opportunity' for impact/influence

References

Jones, H. 2011. A guide to monitoring and evaluating policy influence. *ODI Background Note.* London: Overseas Development Institute.

Sumner, A., Ishmael-Perkins, N. & Lindstrom, J. 2009. Making science of influencing: Assessing the impacts of development research. *IDS Working Paper No. 335.* Brighton: Institute of Development Studies.

ANNEX III: WSIS Forum 2011 – Agenda
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14:45-16:15: Interactive Session, Room IX

Measuring the ICT sector for Political Analysis (ITU/UNCTAD)

MEASURING THE ICT SECTOR FOR POLICY ANALYSIS

The session will provide a brief overview of recent activities of the Partnership on Measuring ICT for Development, including a progress report on e-government indicators. It will also look at the emerging issues to be included in its work agenda to advance ICT measurement.

The session will then focus on the measurement of the ICT-producing sector and its importance for policy analysis. Following an introduction by UNCTAD, the OECD will present progress made in its work on ICT sector statistics. The Network of UNESCO Chairs in Communication (Orbicom) will present the results of its research and training program entitled "Statistical Compilation of the ICT Sector and Policy Analysis" involving researchers and the statistical offices of five developing countries: Brazil, Cameroon, Egypt, India and Malaysia. Participants are encouraged to engage in an active discussion with the panelists on the role of these statistics in policy making, and what lessons can be drawn with the aim to further develop the ICT sector in particular and national economies in general.

Programme

14:00 – 14:30
Launch of new Partnership publication: "Measuring the WSIS targets. A statistical framework"
14:45 – 15:30
Chair: Partner (tbc)
Overview of recent Partnership activities - advancing the ICT measurement agenda (Susan Teltscher, ITU)
Progress report on e-government indicators (Makane Faye, ECA)
15:30 – 16:00
Featured topic: Measuring the ICT producing sector

Partnership intro (Torbjörn Fredriksson, UNCTAD)
Measuring the ICT sector in the OECD countries (OECD)
Introduction to the Orbicom project on measuring the ICT sector (Pierre Giguère)
Rosa Porcaro, Brazil
16:00 – 16:15
Discussion
16:15 – 16:30
Coffee break
16:30 – 17:30
Chair: Albrecht Wirthmann, EUROSTAT
Measuring the ICT producing sector (cont.)
Olivier Nana Nzepa, Cameroon
Nagwa El-Shenawi, Egypt
Payal Malik, India
Ramasamy Ramachandran, Malaysia
Mark Uhrbach, Synthesis report
17:30 – 17:50
Discussion (moderated by George Sciadas)

17:50 – 18:00
Concluding remarks **(by Steering** Committee members)

ANNEX III: WSIS Forum 2011 – Summary

PARTNERSHIP ON MEASURING ICT FOR DEVELOPMENT

WSIS Forum 2011

MEASURING THE ICT SECTOR FOR POLICY ANALYSIS
17 May 2011, 14:45-18:00 hours
Room IX, ILO Headquarters, Geneva

Summary for final report

The session was chaired by UNESCO Institute for Statistics and started with an overview by ITU of recent activities of the *Partnership*. Special attention was given to emerging measurement issues, particularly related to the rapidly growing mobile access to the Internet. This presentation was followed by a progress report on e-government indicators presented by UNECA.

The session then turned to its main theme, the measurement of the ICT sector and its importance for policy analysis. UNCTAD pointed to the internationally agreed definition of the ICT sector and the latest classification that can be used to measure the sector. Although a number of developed economies collect data on the ICT sector, it was noted that only few developing countries do. The OECD highlighted the evolution of the ICT sector definition and presented new data on the ICT sector in OECD countries. Special emphasis was given to the importance of having accurate data to measure the ICT sector's impact on productivity, competitiveness and economic growth.

Orbicom (the Network of UNESCO Chairs in Communication) then presented the results of its research and training programme related to "Statistical Compilation of the ICT Sector and Policy Analysis", involving researchers and statistical offices in Brazil, Cameroon, Egypt, India and Malaysia. The main results of the country studies were presented by researchers from each of the countries, who provided an overview of the magnitude and composition of the respective ICT sectors. While some countries had substantial ICT manufacturing (e.g. Malaysia), others had developed mainly their ICT services (e.g. India). Generally, countries without ICT manufacturing showed ICT trade deficits. In view of the significant variation in size and composition, relevant policy responses needed to be country- as well as industry-specific.

Despite differences, the research also pointed to a number of similarities. For example, ICT sector employees tended to have an above-average level of education and to be younger than employees in other sectors. Furthermore, jobs in the ICT sector were generally perceived as desirable because of upward mobility, job security and the availability of training opportunities. Finally, data suggested that the ICT sector had a relatively high degree of R&D expenditure.

In the lively discussion that followed, several measurement challenges were recognized, including disparities in the gender distribution of employment. There was a lower percentage of women employed in the ICT sector and often women receive lower wages, particularly in the informal sector. Another challenge was related to the need to obtain information from multiple sources within a country. The studies are based on data from various sources, including national accounts, trade statistics and survey data. In this context, the researchers mentioned the importance of transparency and the need for governments to make national data available for research purposes. While data to analyze the ICT sector may be available, they are often "hidden" in surveys and national accounts and scattered across different line ministries, the NSO, the central bank and other institutions. It therefore requires a fair amount of effort to find and analyze the data.

Addressing these and other challenges required collaboration between the different stakeholders. It was recommended that other countries explore the possibility of carrying out similar studies. The role of the Partnership in promoting the availability of data on the ICT sector, especially in developing countries, was stressed.

ANNEX IV: Digital Transformations – Project Extension

DIGITAL TRANSFORMATIONS

Seeking Applied Frameworks and Indicators

An IDRC-ORBICOM project, 2011

CONTEXT

IDRC is moving into an ambitious and multi-faceted area of research over the next five years in the area of more "open" information networked activities with an emphasis on their link to development. A general assumption underlying the new approach is that these new models of more open social organization, collaboration and production bring a powerful and transformative potential for development ('digital transformations'). An additional hypothesis in that setting is that innovation becomes a function of openness, bringing into question traditional models relying on rigorous and elaborate IP regimes.

While the general thrust of such research has been well articulated (IDRC prospectus), due to its sheer reach uncertainties and ambiguities remain in defining methodological approaches that would practically be implemented. In addition, indicators appropriate to capture the spread and evolution of these digital transformations or the extent of their impacts on socio-economic development are currently missing – or certainly do not enjoy a common wider understanding and acceptance. Undoubtedly, issues of scope and boundary specificities are within the realm of the expected in a new and forward-looking initiative. However, any progress that can be made towards the development of appropriate frameworks and the articulation of methodological tools and indicators would be useful in plotting future directions and designing individual research projects.

PROJECT OUTLINE

The research will focus on the area of digital transformations, with emphasis on notions of openness and will be related to development. It will start with a review of known new efforts in this general area, including macro and sectoral approaches on the creative economy, the fair-use economy and the Internet or digital economy. It will then proceed with a critical assessment of what works well and for what purpose in these known new approaches, and identify elements that will not be conducive to IDRC's focus and should therefore be avoided. Moreover, it will explore and define the outlines of alternatives based on other dimensions e.g. commodities, occupations etcetera. This will be done both from a methodological point of view, as well

as from a specific angle aiming at indicators through the production of think-pieces.

Consistent with IDRC's new emphasis, there is a need to investigate how the poor are benefiting from approaches focusing on digital transformations, the ways in which they might be harmed by them, as well as examine whether these new models result in new forms of economic and social opportunities or exclusion. It is also fundamental to understand how to balance the global and national governance of creators, distributors, and consumers' intellectual property rights so that new forms of online income generation can be enabled in emerging networked societies.

One of the key goals of the proposed research will be to explore ways in which an increasingly networked society enables or inhibits actions to address development goals. Examples of research questions include: What is the right balance between the intellectual property rights of creators, distributors, and consumers in networked societies? Is wealth-crating creativity unleashed under the mainstreaming of ICTs independent of advanced ICT skills, and under what conditions related innovations can create employment? How best to define the relation and/or linkages between national approaches and international practices?

ACTORS, PROCESSES, DELIVERABLES AND TIMELINES

Think-pieces will be produced by qualified individual researchers independently. Each researcher will rely on his/her own expertise stemming from long exposure in these areas over the years, with a view to filter through existing methodologies, new attempts to study emerging phenomena and ultimately distil their knowledge to propose viable new proposals. Unlike more stylized projects with well-defined steps, this involves free thinking and the need for syntheses across different domains. *A key objective of the research is to arrive at one or more approaches that can lead to specific new projects in the economic and/or social domains that will monitor, analyze and ultimately illuminate digital transformations.* While the researchers will know of each other and can exchange views, ideas and material, the design is that they will arrive unfettered through their own creativity at a final think-piece independently - even if some messages may end up being contradictory.

The timeline of the project runs from September until the end of November, at which time the final reports will be submitted. A very short interim report will be expected around the end of October, which will describe the direction the researcher is taking at the time, with emphasis on contemplated methodologies and indicators – no contextual narrative as such will be necessary. The final reports too should not contain much background and

peripheral narrative information, so that they present directly the new contributions sought.

Throughout the research period, the scientific director will be in contact with the researchers for any constructive exchanges that will be necessary for their work. These can include brainstorming on specific issues raised by the researchers, particularly pertaining to the desired scope of the work, critical assessments of existing research that will be consulted, including pros, cons and novelty, and generally everything else that will be useful in assisting the researchers. Needless to say, they can interact among themselves freely if they so chose – provided that they do not split areas of research and allocate work this way.

The think-pieces, and any relevant material that may be compiled by the project's scientific director, will form the pillars for a more extended brainstorming among a few selected experts during a specialized workshop. There, the outcome is envisaged to be a synthesis of all proposed work. Moreover, it is expected to culminate in one or more methodological approaches, complete with specific indicators proposed. These will be in the form of articulated suggestions for future research projects. (The exact timing and place of the workshop is not decided at present but it is safely expected to follow shortly after the completion of the two think-pieces).

RESOURCES

In addition to established work on methods and indicators that the researchers are expected to be familiar with, resources are being compiled as part of this research project in the form of recently published work presenting new attempts and alternative approaches to explore different manifestations of the underlying transformations. They will be shared with the researchers from the inception of the project, while others will be shared as they are made available during the research. The idea is not to influence the researchers or point to a particular favourite methodology or way of thinking but rather to take stock of what others are doing, how they approach issues and for what purpose. It is not desirable for the researchers to spend much time on why such approaches may not be suitable to capture what we want – which is why we do our project! It is hoped, though, that such work, critically examined, can stimulate thinking and collectively contribute to serve as the springboard that will provide the intellectual momentum for building new approaches that will go beyond all of them. It is expected that researchers will complement such shared resources with others of their own, and exercise their discretion in sharing among themselves and the scientific director. Some of these resources already compiled, together with summary excerpts, are included below.

- **Creative Economy Report 2010, Creative Economy: A Feasible Development Option**

  Link for full report download:
  http://www.unctad.org/en/docs/ditctab20103_en.pdf

The United Nations published its first Creative Economy Report in early 2008, at a time when the world economy had been undergoing a period of expansion. The report concluded that the creative industries were among the most dynamic sectors of the world economy and offered new, high growth opportunities for developing countries. The report has been widely used by policy makers, development practitioners, and researchers alike. Since the report was written, the world economy has been through turbulent times. Virtually all regions and countries were affected by the global recession and progress towards the Millennium Development Goals was put at risk. Even now, the global economy is fragile. This report builds on the earlier analysis of its predecessor, with new and improved data, showing how creativity, knowledge, culture, and technology can be drivers of job creation, innovation, and social inclusion. It suggests that world trade in creative goods and services remained relatively robust at a time when overall levels of international trade fell. It analyzes the rapid growth in the creative economy sectors across the South and the growing share of creative sector trade which is coming from the South. By exploring the factors behind this growth and the potential for further expansion of the sector the report provides useful input into the ongoing policy debate on feasible development options. Times of crisis offer opportunities to look at new options, approaches, and strategic directions. This report argues that while the creative economy's growth is not in itself a panacea, it does potentially offer more resilient, inclusive, and environmentally viable paths to recovery. Even if there is no one-size-fits-all prescription, the report outlines how governments can play a catalytic role by putting in place the policies, regulations, and institutions needed to strengthen their creative economies. Overall, the creative economy sectors can contribute a lot to growth and prosperity, especially for developing countries seeking to diversify their economies and build resilience to future economic crisis. We commend this report to all who are looking for innovative and sustainable development strategies.

- **Creative Economy Report 2008: The challenge of assessing the creative economy towards informed policy-making**

  Link for full report download:
  http://www.unctad.org/en/docs/ditc20082cer_en.pdf

- **Fair Use in the U.S. Economy**: **Economic Contribution of Industries Relying on Fair Use**
  Thomas Rogers & Andrew Szamosszegi, (CCIA: 2010)

Link for full report download:
http://www.wired.com/images_blogs/threatlevel/2010/04/fairuseecon
omy.pdf

As policy makers focus on how to promote innovation and economic growth, the subject of intellectual property (IP) is frequently raised. While IP is not the only—nor necessarily the best—means to promote innovation in any given case, its expansion is a means frequently urged upon Congress. But at what cost? How much is the economy affected by where the boundaries of intellectual property are drawn? This report employs the latest data available to answer a very important question: what contribution is made to our economy by industries that depend on the limitations to copyright protection when engaged in commerce? As this report shows, such industries make a huge contribution. In an era of highly competitive markets for information goods and services, changes to the boundaries of copyright protection will alter the economic landscape. Broader regulation of economic activity by copyright might encourage additional creativity, but it will deter certain types of technology innovation, and may undermine competition and free expression. Our information policy must therefore balance the incentives that IP regulation creates against the disincentives that result. For 300 years, copyright law has recognized this fragile balance.

However, we are only beginning to fully understand in the 21st century that what copyright leaves unregulated—the 'fair use economy'—is as economically significant as what it regulates. This report attempts to help advance that understanding by utilizing the methodological guidelines established by the World Intellectual Property Organization (WIPO) for calculating economic activities related to copyright. This update of the earlier 2007 report offers the latest economic data on this important policy issue. We must be careful that any attempt to alter our intellectual property laws not overlook any crucial sectors of the economy. To do so would only risk impoverishing important industry sectors and impeding economic growth. We must therefore safeguard the fair use economy from the unintended consequences of overbroad copyright regulation in order to ensure that technology innovators can maximize their contribution to our nation's economic health.

- **Internet matters: The net's sweeping impact on growth, jobs and prosperity**,
  May 2010. McKinsey Global Institute

  Link for full report download:
  http://www.mckinsey.com/mgi/publications/internet_matters/pdfs/MG
  I_internet_matters_full_report.pdf

The Internet is a vast mosaic of economic activity, ranging from millions of daily online transactions and communications to smartphone downloads of TV shows. But little is known about how the Web in its entirety contributes to global growth, productivity, and employment. New McKinsey research into the Internet economies of the G-8 nations as well as Brazil, China, and India, South Korea, and Sweden finds that the Web accounts for a significant and growing portion of global GDP. Indeed, if measured as a sector, Internet-related consumption and expenditure is now bigger than agriculture or energy. On average, the Internet contributes 3.4 percent to GDP in the 13 countries covered by the research—an amount the size of Spain or Canada in terms of GDP, and growing at a faster rate than that of Brazil.

Research prepared by the McKinsey Global Institute and McKinsey's Technology, Media and Telecommunications practice as part of a knowledge partnership with the e-G8 Forum, offers the first quantitative assessment of the impact of the Internet on GDP and growth, while also considering the most relevant tools governments and businesses can use to get the most benefit from the digital transformation. To assess the Internet's contribution to the global economy, the report analyzes two primary sources of value: consumption and supply. The report draws on a macroeconomic approach used in national accounts to calculate the contribution of GDP; a statistical econometric approach; and a microeconomic approach, analyzing the results of a survey of 4,800 small and medium-sized enterprises in a number of different countries.

The Internet's impact on global growth is rising rapidly. The Internet accounted for 21 percent of GDP growth over the last five years among the developed countries MGI studied, a sharp acceleration from the 10 percent contribution over 15 years. Most of the economic value created by the Internet falls outside of the technology sector, with 75 percent of the benefits captured by companies in more traditional industries. The Internet is also a catalyst for job creation. Among 4,800 small and medium sized enterprises surveyed, the Internet created 2.6 jobs for each lost to technology related efficiencies.

The United States is the largest player in the global Internet supply ecosystem, capturing more than 30 percent of global Internet revenues and more than 40 percent of net income. It is also the country with the most balanced structure within the global ecosystem among the 13 countries studied, garnering relatively equal contributions from hardware, software and services and telecommunications. The United Kingdom and Sweden are changing the game, in part driven by the importance and the performance of their telecom operators. India and China are strengthening their position in the global Internet ecosystem rapidly with growth rates of more than 20 percent. France, Canada and Germany have an opportunity to leverage their strong Internet usage to increase their presence in the supply ecosystem. Other Asian countries are rapidly accelerating their influence on the Internet

economy at faster rates than Japan. Brazil, Russia and Italy are in the early stages of Internet supply. They have strong potential for growth.

These findings suggest that corporate leaders will need to sharpen their focus on the opportunities the Internet offers for new products and expanded customer reach. Companies should also pay attention to how quickly Internet technologies can disrupt business models by radically changing markets and driving efficiencies. Public-sector leaders ought to promote broad access to the Internet, since Internet usage, quality of infrastructures, and Internet expenditure, are correlated with higher growth in per capita GDP. For governments, investments in infrastructure, human capital, financial capital and business environment conditions will help strengthen their Internet supply domestic ecosystems.

ANNEX V (a): Workshop on

DIGITAL TRANSFORMATIONS

ORBICOM-IDRC

Montreal, January 12-14, 2012

AGENDA

Thursday, January 12

12 noon - 1 pm	lunch
1 pm - 1:30 pm	Welcome and introductions (Pierre & Laurent)
1:30 pm - 2 pm	Setting the stage (Matthew, George)
2 pm - 3 pm	Communication Capacity (Martin)
3 pm - 3:30 pm	Comments (Mariana, Heather)
3:30pm - 5:00 pm	Discussion (all)

Friday, January 13

9 am - 10 am	Open Platforms (Steve)
10 am – 10:30	Comments (Heather, Mariana)
10:30 am - 12 noon	Discussion (all)
12 noon - 1pm	lunch
1 pm - 2pm	Network Openness and Knowledge Work (Melissa & Francois)
2:00 pm - 2:30 pm	Comments (Mariana, Heather)
2:30pm - 4:00 pm	Discussion (all)
4:00 pm - 5:00 pm	Some other project ideas (George)

Saturday, January 14

9 am - 10 am   Summary of all proposed ideas

10 am - 12 noon   Collective brainstorming

12 noon - 1 pm   lunch

1 pm - 2:30 pm   Roundtable

2:30 pm - 3:30 pm   Rapporteur's Synthesis (Dwayne) and wrap-up

List of Participants

Pierre Giguere, Orbicom

George Sciadas, Orbicom

Steven Song, Village Co.

Francois Barr, USC

Melissa Loudon USC

Martin Hilbert, USC,

Mariana Balboni, ECLAC

Heather Ford, Ushahidi

Laurent Elder, IDRC

Matthew Smith, IDRC

Dwayne Winseck, Carlerton University

Adeel Khamisa, Carleton University

Annex V (b)

Rapporteurs's Report: the Orbicom – IDRC Workshop on Digital Transformations, Montreal, Quebec, Canada January 12 – 14, 2012

Prepared by

Dwayne Winseck, Ph.D.
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and

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January 20, 2012

**Rapporteurs's Report on the Orbicom – IDRC Workshop on
Digital Transformations**

The workshop was an intellectually stimulating and productive event where important research initiatives were put on the table, discussed and critiqued by several experts with diverse backgrounds, from academia, business and the non-profit sector. Two representatives from IDRC also attended and helped drive the discussion.

We begin by summarizing the key points discussed and debated during the two-and-a-half day workshop. We then sketch a broader portrait of the historical and contextual background to the "Information and Networks Program" set out by the IDRC in a prospectus of that name and which lays out the conceptual framework behind the 'open development' research program at the heart of the Montreal meeting. We also circle back to more fully develop points made in the first part of the report.

Two immediate goals were served by the workshop. First, Martin Hilbert provided a provocative and promising set of indices that are designed to measure societies' total communication capacity (TCC) and the distribution of that capacity within countries and between them. The view from the participants was that the approach is ambitious, but feasible, so long as certain fundamental methodological considerations and issues related to data access are adequately addressed. The two statistical methodology experts present - Mariana Balboni, Observatory for the Information Society in Latin American Countries at ECLAC, United Nations as well as George Sciadas, Scientific Director of the Orbicom project – were quite positive about the potential of the project.

Hilbert's proposed indicators and methodology would accomplish three things:

1. comprehensively map developments in communications capacity over time;
2. measure the social distribution of these capacities, i.e. is the gap formerly known as the "digital divide" growing or closing over time relative to the prevailing standards of communication in existence;
3. serve as a proxy for openness, the assumption being that communications capacity help to set the general conditions for the kinds of communications activities that take place.

Sciadas highlighted the need to pin down the conceptual foundations of the approach and to pay close attention to the differences between "stocks" (the invested 'capital stock' in ICTs) and "flows" of information (use). Should IDRC push this project forward, Hilbert will have valuable input from Sciadas and Balboni. There was a high degree of support for this project around the table.

Some concern was raised that an excessive focus on the technical aspects and applications of the TCC method risked obscuring the meaning and value of information and the fact that the cumulative effect of small chunks of information – SMS texts,

Tweets, etc. – often seems to exemplify the refrain that the "whole is greater than the sum of its parts". Heather Ford and one of the author's of this report, Adeel Khamisa illustrated this latter point based on their experience working with Ushahidi – the open source non-profit technology company - during the Haiti & Chile earthquakes.

The need to avoid turning collaboration and open networks into a fetish, while ignoring market reality (Sciadas, Song) or the possibility that Wikinomics, might be the privilege of wealthy countries and not the world in general was also registered. Morton Rask's (2008) study of Wikipedia was cited to the effect that general human development indicators may in fact be stronger influences on who contributes, when and where to the social production of information than broadband access (Ford). Claims that more capacity inevitably leads to greater social and economic participation and openness as a general rule, therefore, should be treated with a healthy dose of skepticism and close attention to the facts on the ground.

The two papers by Francois Bar and Melissa Loudon as well as Stephen Song, respectively, sought more mid-range approaches to creating indices of 'network openness' in relation to mobile and Internet-based networks as well as the applications and activities they support. Everybody agreed that defining openness is essential but readily acknowledged that there is no magic set of criteria for doing so.

Bar and Loudon proposed to help close the gap through four case studies designed to link the theoretical idea of openness with actual uses and outcomes in the real world: Open Source Research Projects (e.g. Elipse, Moodle, Ushahidi); Mobile Apps marketplace (e.g. Apple's closed iOS system versus Google's Android); (3) Online Brokers for Work (e.g. Jana/TxtEagle, Mobenzi, Amazon's Mechanical Turk); (4) Open Access Journals. Steve Song added that there is a need to select case studies that compare commercial, government-led and collaborative models, respectively. He proposed that this could be done in two ways. First, by considering the closed proprietary model of mobile phone development, the "Mobile Miracle" as he called it, versus the Internet model. Second, by comparing three different medical health record system companies: OpenMRS (an open source system), SmartCare (state-funded) and Meditech (a commercial company). Apparently health care falls outside this project's remit, but the idea of comparative case studies of different economic models was well-taken. Heather Ford also added that it is important to look not just at positive cases of success, but initiatives that have failed. Furthermore, our timelines for achieving success should take into consideration the challenges of introducing the values associated with openness into a culture.

General Conclusions

There was general agreement that the Hilbert project should be further developed and supported, with the recommendation that the effort be supplemented with some survey work as well as conducted in countries where good data collection has already been put in place by telecommunications and broadcast network operators.

There was also much support for the proposals offered by Bar and Loudon, on the one hand, and Song, on the other, perhaps merging them into a single, coherent research project. The emphasis appeared to narrow from the many potential cases studies that were originally set out in these papers to two: first, a case study that focuses on online labour brokers and conditions of work entailed by such arrangements and, second, another than focuses on open access journals in developing countries. The latter was proposed on the basis that there is now a fairly robust body of knowledge about experience with open access journal in northern countries but very little in the global south. The representatives from IDRC expressed a very clear interest in continuing to pursue such proposals. George Sciadas was tasked to continue communicating with the researchers, with a view to further elaborate the proposals.

Part II: The Place of Digital Transformations and the Proposed Information and Networks Research Program in the "Big Picture".

While the workshop took place over two-and-a-half days, the groundwork was laid in the months before by the papers commissioned from the authors introduced above and the IDRC's (2011) prospectus on the "Information and Networks" research program. We read each of the three papers circulated a few weeks prior to the meeting and in the days just prior to the meeting. Dwayne sketched out some ideas about how this proposed research program fits into the broader sweep of communication and development research. Adeel added to the effort by assimilating new insights drawn from the meetings with his own expertise and experience with the technologies and practices of collaborative media and data visualization as part of our report.

The idea of harnessing information, communication, media and knowledge to the improvement of human conditions is not new. The right to receive and impart information regardless of frontiers was established well before being enshrined in Article 19 of the United Nation's Declaration of Human Rights as part of the post-WWII 'big Bretton Woods Settlement' beyond the economic institutional framework laid down by the World Bank, IMF and GATT. In what historian Richard John (2010) calls one of the most radical and democratic pieces of legislation ever, the U.S. *Postal Act* of 1792 was animated by the underlying belief that a universal, cheap, government-owned postal system was essential to bring information to every man's doorstep. Of course, the reference to "man" was not gender neutral. In New Zealand, post master generals one after another from the 1870s onwards raved about how progressive efforts to bring about cheaper rates for news and social letters by international cable and domestic telegraphs, and eventually by way of a cooperative, multinational government-owned imperial cable

across the Pacific (1902), was revolutionizing the social, economic and cultural life of the country. Communication, culture and religion have also been used to subjugate and educate, in equal measure, the Natives, from one end of the globe to the other, since the 15th century. Communication and power, as Manuel Castell's (2009) states, are inseparable.

During the late-19th and 20th centuries – the industrial media age, as Benkler (2006) calls the period – information was relatively scarce and expensive, and communication facilities concentrated, costly and centralized as a result. The techno-economic-institutional scale of communication was paralleled by the development of mass society and the mass audience. The mass audience, in turn, was a short step away from the "fear of the crowd" expressed by Gustave LeBon in the 1870s, Carl Schmitt, Harold Lasswell and Edward Bernays in the 1920s and 1930s, and into the 1970s when some referred to the excesses of television as precipitating a 'crisis of democracy'. Managing public opinion on a mass scale became a fixture of consumer capitalism and democratic politics.

Belief in the strong power of communication, knowledge and media to change the world reached its apogee in 1958 when MIT scholar Daniel Lerner published a ground-breaking volume based on his research in the remote villages of Turkey, *The Passing of Traditional Society*. Lerner argued that the brakes to development in the "third world" were cultural and in the minds and habits of the people. The new media of communication – mass press, radio, cinema, books, television – could help change these orientations by priming the 'psychic mobility' of the peasants, allowing them to imagine a modern destination as an escape route from tradition, poverty and static lives (Shah, 2010). There would be innovators and early adopters, the masses and laggards, ideas whose longevity and taken-for-grantedness is evidence in everyday discussions about technological innovations today.

The modernization thesis and its close cousin, the diffusion of innovation literature, cast a long shadow. UNESCO followed by adopting the ideas that more cinema attendance, radios, newspapers per thousand (cpm), etc. would be good indices of development and, crucially, one of development's main drivers. Visiting and living in China for the time in 1989, one of this report's authors (Winseck) was struck by the fact that Lerner and the modernization school were required reading for media experts working the state-run media apparatus in the country. Ideas and how we think about communication power matters because they become programs for actions under all kinds of conditions, both those that are intended by their authors and in others never contemplated.

The iteration of development now spear-headed and imagined by the IDRC and Orbicom stands in a long line of efforts that put info-comm and media technologies at the centre of development efforts. Reading the prospectus for the 'information and networks program' and attending the meeting did not give the impression that many of the lessons to be drawn from the above points have been taken account of. A sense of the 'new-new' is much more obvious.
There are flourishes of references to relevant historical literature in the IDRC's prospectus (Inglehardt, 1997; Norris, 2011) and Hilbert (Machlup and Porat). The

importance of lessons learned from past experience was also visible in the fact that Heather Ford, a cultural anthropologist from Ushahidi, attended and contributed to the meeting.

Network-Centrism and Technological Determinism

The focus of the prospectus, papers and much of the discussion during the meeting was on the affordances of network ICTs, or more specifically the idea that openness is a function of the technological infrastructure itself. Much was made of the standard layered model of network ICTs represented by the OSI model. Significant questions are raised by the Song and Bar and Louden papers about just where openness is actually located within different layers of networks (infrastructure, applications, content/uses), what criteria should be used to measure such characteristics and the kinds of outcomes that out to be assessed. Discussion also led to the idea that there are many tensions between the theoretical ideal of openness and a complex reality where openness may not always be desirable. For example the story of land title registry information in Bangalore, where open access to government information led to the appropriation of what was hoped to be a public good (land title data) by elite property owners who captured both the information and the land it referred to. Song also noted that there are instances where closed characteristics may lead to desirable outcomes, citing the examples of mobile telephony and Facebook.

The network-centric understanding of openness derives mainly from the work of scholars such as Castells, Benkler, Lessig and Zittrain. They give us the ideas of the network society, the layered model of open networks and principles of network generativity, respectively. Bar and Louden's paper reflects these ideas by, for instance, highlighting four assumptions about open networks. Openness is positively liked to innovation, disintermediation, greater participation and global reach. They also suggest four dimensions for assessing openness: one, the ease with which people can join a network; two, configuration, or the affordances and constraints embedded in the design of networks, third, the configurability and capacity of users to discover new and unanticipated uses, and four, the capacity of networks to cross borders. Lastly, they offered four possible case studies to examine these characteristics: open source research projects (e.g. Elipse, Moodle, Ushahidi), the mobile applications marketplace (e.g. Apple's closed iOS system versus Google's Android), online brokers for work (e.g. Jana/ TxtEagle, Mobenzi, Amazon's Mechanical Turk), and open access journals.

The authors were fully aware that mapping these ideals onto the conditions in developing countries was fraught with several difficulties. In particular, three criticisms stand out with respect to making it the cornerstone of some kind of 'open development model':

First, the OA and OS models themselves are mostly Euro-American products. How realistic is it that they can simply be exported to the world at large?
Second, the open network model of development picks up on only one side of a protracted debate about network architectures and control within Euro-American contexts. Even in these contexts, there is staunch opposition to the open network model,

as the debates over net-neutrality, privacy and copyright illustrate. Similar tensions, in different forms, will be replicated in other environments. In addition, we can ask if opening up societies could also make them vulnerable to new forms of exploitation and the creation of an infrastructure which is conducive to surveillance?

Third, questions were raised during discussion about the appropriateness of focusing on things like mobile apps in a developing world when their availability remains limited despite the explosive growth in mobile phone use.

Cultural Openness and Practices in the Network Society

Openness is not just a consequence of networks and technology. Anthropological and other historical studies of the Internet for example make strong arguments that the openness of the network reflects the culture that created it, as reflected for instance in the open-ended character of the request-for-comment development of standards and their evolution over a very long period of time (Braman, 2010; Lessig, 1999). This is acknowledged in Song's paper, but not as developed there or in any of the papers to the extent that they probably should be.

There is a tentative nod in recognizing this in the IDRC's mapping document, when the author(s) refer to the work of Inglehardt (1997) and Norris (2011). While we have not read the latter's new edition of *Critical Citizens*, Winseck read its earlier 1999 version. If her arguments still hold, and the comments above correct, it may be worthwhile to shift away from, or at least seriously add to, the Internet-centric approach by expanding on Norris's (1999) claim that citizen's capabilities – education, values, community engagement and knowledge – have become more potent overtime (*strong citizens*), while it is impermeable, immovable, opaque, etc. institutions that make for *weak democracy*. In other words, the main problem is not one of citizens' capabilities but institutional blockages.

A large part of the unexplored issues stems from the lack of discussion around cultural behaviors that are necessary to support development. An internet-centric view of the world obscures the deeper cultural roots of openness and sharing. Instead, it seems to us that it is equally important to gauge how openly the cultures and societies being studied already share knowledge, time, meanings, and gifts. The role of cultural anthropologists and others students of culture can play a bigger role in this respect.

Paul Starr (2004) makes a similar observation in his history of the modern mass media in North America, Britain and Europe, arguing that in each place, the development of the post, press, telegraph, telephone, cinema and broadcasting hinged on the openness of markets, the political and legal system, and the overall culture. Where Parliament, markets and the courts were closed, the same medium that flourished elsewhere languished. Too much focus on the openness of info-comm and media technologies misses the fact that they are relay links in the flow of information from institutional

centres. Without transparency at the institutional and cultural levels, transparency and openness in the networks will not be maximized.

A common referent across the papers is Manuel Castells' *Communication Power* (2009) and to a lesser extent his *Network Society* trilogy (1996-2000). These are highly respected sources from which to draw *some* inspiration and guidance on the issues at hand, and those raised earlier specifically. There was also much focus, especially in terms of the IDRC's framing document, on important, recent scholarly contributions as well, such as those of Yochai Benkler, who focuses on the social production of information and value outside the market or firm, and others who speak of the wisdom of the crowd, produsers, etc (Shirky, 2008; Shirky, 2011; Bruns, 2008).

Castells' evocative idea that networks equal the new axial principle of economic, social, political and cultural organization fits the prevailing rhetoric of the day that now informs these kinds of discussions. References to the "Creative Industries" is another example of fashionable rhetoric used but whose utility and contested nature should be given more attention. The "creative industries" is exceedingly broad, indiscriminately mixing fashion, film industries, software and designers all under one label with little indication of what they share in common other than some fuzzy idea of creativity and innovation (Garnham, 2005; Miege, 2011; Tremblay, 2011).

Some references to power in the discussions also took place, especially in relation to online brokers of piece-work and contract labour. To the extent that power was raised as an issue, it was based on Castell's views of power and counter-power. Some question the adequacy of Castell's conception of power insofar that it highlights the role of 'crowds' using social media to *contest* media, political and commercial power, but without paying sufficient attention to one of most important features of power: the ability to actually change things (Fuchs, 2011).

Observers such as Shirky and much of the discourse about the wisdom of the crowds, cognitive surplus, Wikinomics, etc. sometimes seem as if they are inverting the old 'fear of the crowd' views discussed earlier. The inversion, however, gets us no closer to understanding than did the 'old model' that feared the herd mentality. Now, instead the pendulum has swung to the opposite side, substituting utopian views for dystopian ones, and obscuring the more textured, layered and complex reality of social communication as a consequence. Some scholars, for instance, and in contrast, point to online hierarchies and stratification in terms of opinion leaders, information flows and other factors related to the use of internet-based media (Hindman, 2008).

Shirky's (2008, 2011) claims about cognitive surplus, the power of crowds and the role of Facebook, Twitter and so on in revolutionary times is also seen by some as excessive (see Sreberny & Khiabany, 2010; Cole, 2011). In addition, our personal biographies are not only d-i-y biographies cobbled together online, but the fountain of an enormous surfeit of personal information and transactional information. Social media and search engine companies' entire business model is premised on maximizing the collection, retention, analysis, use and commodification of personal information generated as a byproduct of a

life online. Digital, network media expand commercial markets in information about us and increase surveillance, as the prospectus and some of the other papers mention (Song), but such concerns were raised mostly in passing and did not frame the discussion. Benkler (2006), in contrast, works hard at establishing a better balance between power and hierarchy in the network economy and public sphere, on the one side, and the opportunities enabled by social communication on the other.

Digital network media also excavate hidden economies. All societies consist of multiple economies: we produce for ourselves (self-production), for others (social) and for the market (Aristotle). It is the recovery of the social economy that seems most evident today with the rise and ubiquity of social media. The 'digital media economy' excavates the taken-for-granted backdrop of everyday life and, by mediating it through digitally networked communications, gives a presence to that which up until recently was invisible, only tacit, or taken for granted. This is the search and social media economy at the heart of Benkler's (2006) account, and in Castell's (2009) account as well. This is a common backbone across the prospectus prepared by IDRC, and in each of the papers prepared for the meeting. It is an important and central element of this research mapping exercise.

Bar and Loudon proposal to study four different applications of 'open network logic' – open source software, App markets, online digital labour brokers and open access journals – is a good way to approach the different kinds of economies enabled by the Internet and mobile devices (pp. 4-6). Their case studies connect their desire to understand different notions of openness to specific applications and network contexts. We also wonder if this focus might benefit by relating it to comparative studies of the policy, market and institutional contexts surrounding broadband development in different countries (Benkler, et. al. 2010)? Song also argued that it would be useful to temper some of the more grandiose claims made by open source, open network, open sharing advocates, etc. by studying the "Mobile Miracle" -- "an extraordinary success story in the developing world" (p. 3) – based on proprietary and closed standards. The messy and chaotic commercialization of mobile phone services, with 'walled gardens', cheap prepaid plans and so forth can usefully augment the case studies proposed by Bar and Loudon.

The response to Song's paper highlighted many of the challenges of developing a schema for assessing openness. Any attempt to define the term quickly encounters questions about what the criteria are, where within the layered ecology openness should be sought, how it can be measured, and finally how openness is linked to development. This is yet another reason why we need to link openness at the level of technology with questions about cultural predispositions.

It is not just the advent of decentralized social media and communication technologies associated with web 2.0 that should be drawing our attention, but also the fact that it is now a veritable golden age for newspapers and television in Brazil, Russia, India, China, Indonesia and Turkey, among other developing countries. How do personal social media and the mass media relate to one another and fit together within this context? These

questions are not raised, and we wonder if these elements of the network and information ecology can be so easily disentangled from one another? Fidelity to Castells and Benkler as the intellectual touchstones of this research program suggest that they cannot.

Statistics about networks and access to ICTs have to be read with a bit of circumspection. The number of telephone users worldwide rose from 800 million in 1998 to 4.2 billion in 2009, while the number of mobile phone users soared to 4.5 billion subscribers. Last year the number was 5 billion mobile phone users. Two billion people use the internet in 2010, about ten times the number in 1998. Today, 28.7 percent of the world's population has internet access; up from five percent twelve years ago, although it is still sobering that 70 percent of people have no access whatsoever. In 1996, two-thirds of all internet users lived in the US; since 2009, China has had the most internet users, although citizens in the US are more than twice as likely (77 percent) to have internet access than their counterparts in China (30 percent). A recent UNCTAD/ITU study from 2010 concludes that overall, the *primary* trend is "*growing* equality over time in the global distributions of Internet users, mobile and fixed [phone] lines (p. 26).

Yet, for all this, the gap between the 'info rich' and the 'info poor' is still significant. People who live in OECD countries are more than *three hundred times* likely to have broadband internet access than people in the poorest regions (UNCTAD/ITU, 2007, p. 22; ITU, 2010, pp. 195-202; Internet World Stats, 2010). Our Carleton University colleague Tokumbo Ojo observes that in Africa, it is common for the wealth urban elite to pack multiple cellphones from multiple companies to make up for shoddy service, patchy coverage and as a display of status.

This underscores the significance of assessing the distribution of communications capacity, as Martin Hilbert suggests. He defines access relative to the reigning capabilities versus some absolute level. Measuring inequality and intensity of information flows is essential and Hilbert lays out a helpful starting point derived from Claude Shannon's information theory. At same time, Hilbert's approach needs to be mindful of three questions, most of which were raised in one way or another by the participants at the meeting.

One, the conceptualization of adequate measures of the 'information intensity' of society has been a contested issue since the foundational work of Machlup and Porat in the 1960s and 1970s, respectively. These issues still stand and there was much debate and discussion about: A, just what was being counted and B, whether quantitative measures captured all that was necessary in understanding information flows and communication capabilities. There seems to be consensus amongst participants about the essential need to measure the quantity of stocks and flows of information, but some significant debate as to whether the two needed to be measured separately or jointly by a combined capacity model, with the latter being proposed by Hilbert.

Ushahidi provides an excellent example of where we can see novel methods of innovation that may remain uncounted if we count bits in the way Hilbert suggests. While the focus has been on data intensive uses, Ushahidi demonstrates that what at first

blush might appear to be low data intensity may in fact be information rich when seen through a different lens. While Hilbert addresses the efficiencies of compression technologies, Ushahidi exhibits efficiencies of networked communication. That is low bandwidth data transfer associated with text messaging is capable of producing a greater efficiency in concert with other data points and sources; the whole is greater than the sum of its parts.

In addition, there was also concern that measuring quantity should not override questions about our need to understand the meaning, salience, utility of information. The link between volumes of information flows and different understandings of value – economic, social and cultural – are far from clear-cut. Information is characterized by dual standards of value whereby both scarcity – a secret, a well spun phrase, a beautiful poem – are the source of value and large quantity – terabytes, massive processing, transmission and storage capacity, etc. – both can establish value. How to reconcile the quantity/value (meaning) conundrum in approach set out by Hilbert? This was ultimately the elephant in the room that this project will have to address.

We acknowledge the pragmatics of the epistemological accommodations Hilbert makes in his method. That is, he works to develop methods for analyzing data that can realistically be obtained. Although there are limitations of what can be measured, he does not allow the difficulty of capturing the entire reality of a situation to impede what can be accomplished in light of the material that is available. Furthermore, he provides a good argument for this approach. By plucking the "low hanging fruit off an incredibly high tree", he seeks to study what is quantifiable. Some may interpret this is quantitative orthodoxy, but it can also be seen as an acknowledgement that the qualitative aspects remain to be largely unexplored.

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