# INF5850 - ICT for Development: Building a Better World?

**Course content**

ICT for Development is an emergent and important discipline within Information Systems, and supporting career paths in ICT companies working in development, development agencies, and government and non-government organizations engaged in introducing ICT projects to support achieving development agendas. The ICT landscape is comprised of state of the art technologies involving mobile, social media, cloud hosting, and various others. This provides an exciting arena for IT graduate students to engage with cutting edge technologies and also participate in broader social development processes.

**Learning outcomes**

Key learning outcomes of the course:

* to conceptualize ICT for development, with emphasis on the relationship between technology and development in particular socio-political situated contexts
* to analyze different perspectives on development and the manner in which we can understand ICTs from these perspectives
* to analyze the nature of ICT applications in different development domains such as health, education, water and sanitation, and migration
* to analyze various approaches to evaluate the outcome of ICT for Development projects
* to analyze what are emerging ICT applications, and also emerging new development challenges in contemporary society
* to be able to critically analyze if ICTs are helping to create a better world in a development context

**Course organization**

The course will be organized over 4 broad modules:

1. What do we mean by development?
2. What do we mean by ICTs for development?
3. Analyzing the relation between ICTs and development
4. Are ICTs creating a better world?

An overview of each of the four modules is now presented.

**Module 1: What do we mean by development?**

Development has multiple perspectives and meanings associated with it, but an underlying meaning is about making a better life for everyone. The world in which we live in grossly unequal, so naturally what “better” means will vary with people and geographies. For example, in the context of public health, while for many of the poor, basic services such as for child birth and immunization are not easily accessible, while the rich are engaged in accessing high cost medical tourism services, delivered in five-star like hospitals. These inequalities exist within and across countries. Beyond meeting basic needs, development is subject to meeting material and cultural visions of different societies. The needs, visions, and aspirations of those living in developing countries are naturally different from those in rich countries. For the rich, the vision of basic needs could be of having a healthy and green environment to live in, eating organic food, having regular holidays to exotic places, maintaining work-life balance and so on. For the poor from developing countries, basic needs are around receiving subsistence food, a place to stay, clothes, good health and opportunities for everyday livelihood. Policy responses to achieving these needs vary with contexts with implications on the kinds of ICT initiatives are deployed. .

Development implying a better life for all, has a strong emotive appeal, and may not be subject to huge disagreements. Development also represents a founding belief of modernity, where it is assumed that rationality and technology will change the world for the better. Development also carries with it a neo-liberal ideology of freedom and rationality, which may often mask the potential adverse impacts of politics and conflict around the agendas of development itself. This neo-liberal ideology may only force us to see the positive values associated with development, which may lose focus on the underlying motives of the different actors involved, such as of furthering business motives in the name of development. The impact of such ideological and modernity underpinnings is especially visible in the contexts of ICTs, where developing countries every day are confronted with increasingly modern technologies to solve historically existing institutional problems. Every so often, a new technology, such as the smartphone or the tablet, is presented as a silver bullet for solving existing social problems, and is adopted up by governments. Technologies, when not designed and implemented based on context specific approaches, can create more problems than solutions, and often are addressing the wrong problems.

In this module, we will discuss different perspectives on development starting with the historically existing one associated with economic growth, a trend which has come to be challenged in recent years. Economic growth means achieving a more massive economy, producing more goods and services, and developing larger income levels. However, economic growth can be achieved without touching development problems of inequality and poverty since benefits may accrue most often to those not experiencing development challenges. It was for long assumed that economic growth will be accompanied with trickle down effects, where the benefits will slowly start to flow down from the rich to the less rich. Failure of this theory and these assumptions which underlie projects of the World Bank and IMF over many decades have led to various critiques, and today development carries quite different and expanded notions than of classical economic growth.

One important critique which we will discuss comes from the Nobel Prize winning economist Amartya Sen. His ideas provide the basis for conceptualizing development from a humanistic perspective where the focus is on the ability of people to pursue the choices they value, and what are the “unfreedoms” they experience in achieving their goals. Development then is about trying to remove these unfreedoms to enable individuals to convert their “capabilities” into “functionings”. That is the potential they have, how can these be converted to realized potentials so that individuals can achieve what they aspire for.

Marx’s views, though seen by many as historically redundant, may be very relevant to understand contemporary development challenges, and we will explore how? We will particularly use his ideas around “value” – use and exchange – to ask critical questions around who generates value, who gets the benefits from this, and what are systems and processes through which power and value asymmetries are created and maintained. We will discuss Marx’s ideas in the context of ICTs and development, since ICTs are positioned as being able to create value for developing nations, but often this value does not accrue to them, and it flows back to where it only reinforces existing power and knowledge assymetries.

Finally, we will discuss Manuel Castells and his ideas relating to an “informational capitalism”, which is relevant to understanding development from an information/ICT perspective. Castells has argued that for nations today, engaging in the “network society” is fundamental to alleviate their development concerns. The more they are excluded from this network society, they risk getting increasingly marginalized and falling deeper into the development (or its lack) hole. However, becoming a part of this network society is not a trivial issue, where we can just “plug and play”, but requires overcoming historical and institutional embedded constraints.

**References**

***Compulsory reading***

Peet, R., & Hartwick, E. (2009). Theories of Development: Contentions, Arguments. Alternatives. Guilford Press, New York, NY. (chapters 1, 2 and 4)

Mosse, E.L. and Sahay, S. (2005). The role of communication practices in the strengthening of counter networks: case experiences from the health care sector of Mozambique, Information Technology for Development, Special Issue: Information Technology for health care in Mozambique, 11, 3, 207-225.

 Mukherjee, A.S. (2016). Empowerment: The invisible element in ICT4D projects? The case of public health information systems in India and Kenya (selected excerpts relating to Capability Approach). Unpublished PhD Thesis, Department of Informatics, University of Oslo, Norway.

Sen, Amartya (1999). Development as freedom (1st ed.). New York: Oxford University Press, Chapters 1 and 2.

Karl Marx "The Communist Manifesto", pages 14-21

***Reference reading***

Castells, M. (1996). The Information Age: Economy, Society and Culture, Volume 1: Rise of the Network Society, Oxford, Blackwell

Peet, R., & Hartwick, E. (2009). Theories of Development: Contentions, Arguments. Alternatives. Guilford Press, New York, NY.

Sen, Amartya (1999). Development as freedom (1st ed.). New York: Oxford University Press

Robeyns, Ingrid, "The Capability Approach", The Stanford Encyclopedia of Philosophy (Summer 2011 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/sum2011/entries/capability-approach/>.

Valtanen. M. Identity, structure and ideology: Manuel Castells’ contribution to identity, policy discussion (<http://www.inter-disciplinary.net/ati/diversity/multiculturalism/mcb1/Valtanen%20paper.pdf>), Accessed September 10, 2016.

**Module 2: What do we mean by ICTs for development?**

While it can be considered a field of its own, ICTD as a discipline draws from two academic and practical fields; development studies and IT studies. However, the interdisciplinary nature is seldom visible in current research on ICTD, which often focuses on one of the parts only, and predominately on technology given the origin in IT studies. In this module we start by examining how the fields of development and IT (or ICTD) treat "the other". How does the discourse on development, both in research and policy, treat technology? How are critical development issues discussed in the ICTD field? A constant danger is that important perspectives are lost if we do not manage to combine the two field adequately. For example, development initiatives might be built on sound economic and social research, but can fail if they treat technology as an trivial external component, that can be bought "off the shelf" and will function as intended from the start. Likewise, careful attention to IT development and implementation strategies might not lead to success if other factors - social, economic, cultural – are not considered.

A central goal of ICTD is that it should lead to lasting impact. Development, uptake, adoption of technology should be resilient, meaning that the technology and supporting organizations should be robust enough to endure over time and react to changing needs and environments. This is a perennial question in all ICT projects, and those involved in ICTD should treat it no different. We will in this module examine challenges to this. For instance, a buyer of technology in a less-resourceful environment might find it hard to pay for licenses and software updates, to keep adequate anti-virus applications up-to-date, to find people with the right skills, or to continually develop their technology. We will also discuss some approaches to meet these challenges.

In this regard, we will discuss strategies for sustainability and appropriation. Central to this is the question of power, over the technology and the ability to change it and develop it to your own needs, and over the knowledge necessary to do this. Free and open source software has been hailed as empowering as it contributes to lowering the costs and opening up for innovation, but it is no silver bullet. For instance, open source has a tendency to be confused with no costs, but software licenses are only one part of the equation of a long-lasting, functioning and evolving information system. The notion that the software is free, like in free to make changes, has a larger potential in development in that it allows anyone to appropriate the technology and modify, develop, and learn from it. We will look at research on open source in the context of development, and the possibilities, challenges, and merits in this regard.

*Compulsory readings*

Avgerou, Chrisanthi. “Information Systems in Developing Countries: A Critical Research Review.” *Journal of Information Technology* 23, no. 3 (2008): 133–146.

Sahay, Walsham, unpublished: Information technology, innovation and human development: hospital information systems in an indian state

*Recommended readings*

**Module 3: Analyzing the relation between ICT and development**

A central theme in ICTD has been how technology travels from where it was originally conceived. As the majority of innovation takes place in advanced economies, the situation is often that the technology has been created in, and for, a context quite different from that in most developing countries. The notion of "technology transfer" is often visited in the ICTD discourse, and has received much criticism and nuancing. This theoretical field developed much about at the same time as the growth of the international development scene, where it was assumed the “south” needed to be given the technology which the “north” is developing. Rogers’ ([1962](#_ENREF_108)) early S-shaped curve aimed to describe the diffusion of technology, assuming a centre and periphery. He saw this diffusion as passing through five stages; knowledge, persuasion, decision, implementation, and confirmation. His writings influenced the IS field, through the Technology Acceptance Model (TAM) ([Davis 1989](#_ENREF_32)), describing how users come to accept new technology. Such centre-periphery replication logic has later come under critique. For example, Nhampossa argues how the cognitive basis of these models tends to limit our understanding of the system in its broader context ([Nhampossa 2005](#_ENREF_89)). Many have pointed out that cultural, institutional and infrastructural differences have made such replication challenging ([Braa, Monteiro et al. 1995](#_ENREF_17), [Sahay and Walsham 1999](#_ENREF_114), [Heeks 2002](#_ENREF_61)). With development taking place detached from the setting the technology will be used, such “design from nowhere” ([Suchman 2002](#_ENREF_127)) can lead to design-reality gaps, an important contributor to failed IS projects([Heeks 2002](#_ENREF_61)).

Braa, Monteiro, and Reinert argue for speaking of technology *learning* rather then *transfer*, as technology has to be learned within the new social and cultural contexts of use to where it is being moved ([Braa, Monteiro et al. 1995](#_ENREF_17)).

A more useful concept, which also takes into account changes of the technology, not just its use, is technology *translation* ([Akrich 1992](#_ENREF_1), Sahay et al 2013). In a study of the “transfer” of a forestry waste pulping machine from Sweden to Nicaragua, Akrich shows how the interplay between the context and the technology changes both, one small step at a time. Modifications to the machine to handle cotton stalks instead of forestry waste, changes in storage facilities and methods to combat a certain Nicaraguan insect, and the development of a completely new economic niche to sell the resulting product to local bakeries are all changes created through the interplay of the original technology and the Nicaraguan context. The technology is slowly translated into the “local language”, though it is perhaps misleading to use this linguistic term.

Another strand of literature, social embeddedness, takes the view that the development and use of ICT artefacts in developing countries concerns the construction of new techno-organizational arrangements in the local context of a developing country. It focuses attention on the embeddedness of ICT innovation in the social context of various organizational settings.

Frugal innovation is another theme that will be explored in this module. Frugality, being sparing or economical with regard to resources, is an appropriate philosophy for a world facing a shortage of resources, an increasing frequency of severe weather events, financial austerity in many developed economies, and where the majority of the population lives in highly resource-constrained economies (Watson et al 2012). A frugal IS is an information system that is developed and deployed with minimal resources to meet the pre-eminent goal of the client.

Lastly, we will look at how civil society, such as non-governmental organizations, can use ICT to mediate between the government and the poor.

*Compulsory readings*

Nhampossa, José Leopoldo. “Re-Thinking Technology Transfer as Technology Translation: A Case Study of Health Information Systems in Mozambique.” University of Oslo Norway, 2005. <http://heim.ifi.uio.no/~jensj/Nhampossa2005TechTransferTechTranslationHIS.pdf>. **Chapters 2 and 6**

Heeks, Richard. “Information Systems and Developing Countries: Failure, Success, and Local Improvisations.” *The Information Society* 18, no. 2 (2002): 101–112.

Suchman, Lucy. “Located Accountabilities in Technology Production.” *Scandinavian Journal of Information Systems* 14, no. 2 (January 1, 2002). http://aisel.aisnet.org/sjis/vol14/iss2/7.

Avgerou, Chrisanthi. “Discourses on ICT and Development.” *Information Technologies and International Development* 6, no. 3 (2010): 1–18.

Madon, S., and S. Sahay. “An Information-Based Model of NGO Mediation for the Empowerment of Slum Dwellers in Bangalore.” *The Information Society* 18, no. 1 (January 2002): 13–19. doi:10.1080/01972240252818199.

Watson, Richard T., K. Niki Kunene, and M. Sirajul Islam. “Frugal Information Systems (IS).” *Information Technology for Development* 19, no. 2 (April 1, 2013): 176–87. doi:10.1080/02681102.2012.714349.

*Recommended readings*

Laet, Marianne de, and Annemarie Mol. “The Zimbabwe Bush Pump Mechanics of a Fluid Technology.” *Social Studies of Science* 30, no. 2 (April 1, 2000): 225–63. doi:10.1177/030631200030002002.

Braa, Jorn, Eric Monteiro, and Erik S. Reinert. “Technology Transfer vs. Technological Learning: It‐infrastructure and Health Care in Developing Countries.” *Information Technology for Development* 6, no. 1 (March 1, 1995): 15–23. doi:10.1080/02681102.1995.9525252.

Sahay, Sundeep, Johan Sæbø, and Jørn Braa. “Scaling of HIS in a Global Context: Same, Same, but Different.” *Information and Organization* 23, no. 4 (October 2013): 294–323. doi:10.1016/j.infoandorg.2013.08.002.

**Module 4: Are ICTs creating a better world?**

“Are we building a better world with ICTs” is a question which Geoff Walsham, Professor Emeritus Cambridge University, has posed to information systems researchers to engage with. In this module, we will try to engage with this question, a complex task, to try and emphasize the importance of the question and to situate it within the context of our ongoing ICT4D efforts. This question is central to the theme of ICT4D, as it helps provide a normative framework in which the design, development, implementation and use of information systems can be examined and improved.

Brian Easlea, who died in 2012 aged 76, has been a source of inspiration in the development of this module. As an internationalist, teacher and avid bird watcher, he was an influential advocate for a better world. His academic background was in theoretical physics, having studied under the Nobel prize winner Niels Bohr as a postgraduate and later teaching in his Institute for Theoretical Physics in Copenhagen. Easlea joined the University of Sussex in 1964 to lecture in theoretical physics but his life was transformed visiting colleagues in Brazil. He saw serious social and economic inequalities, and also the military regime's brutal repression. As a theoretical physicist, he was also aware of the grave ethical and political concerns of eminent scientists such as Bohr and Albert Einstein, and was haunted by the idea of nuclear warfare. He retired in 1987, devoting his life to watching birds.

Some of the issues we will examine in this module concerns who are the ”we” in the question of are we using ICTs to create a better world? **We are not “value free social scientists”!** and we will take as example of the “we” to be the participants in the class and other like minded people concerned with “social implications of computers with developing countries.” Maybe then, and a little crudely possibly, we can say we are practicing social scientists interested in understanding how ICTs are contributing to development, and their social implications. We are also, at least some of us, trying to steer these development efforts in directions which we feel are directed towards creating a “better” world. These endeavors are by definition not value free exercises. As we analyze these issues around ICTs and development, we also tend to suggest possible solutions. Accepting or not of a particular solution will differ with social scientists, depending on their respective values and norms. As Brian Easlea has argued (page 274):

Values and goals inform all significant social activity. Without values and without goals, human enterprises, if they can be conceived of starting at all, must inevitably peter out into a wasteland of trivialities. Champions of “value free” enterprises are deceiving themselves. Nowhere, of course, is self-deception greater than in the social sciences. Value free social sciences does not and cannot exist.

Given that we as practicing social scientists have our particular values and norms, we will try to understand what these values are and how they shape our notions of what means better. These notions then drive our efforts to develop different futures through the medium of ICT4D efforts. We will try to engage in critical discussions the agendas that emerge from our notions of better and how do they inform priority setting. The implication of a new approach or perspective to the future for the social scientist would be quite fundamentally different from that in physical sciences who see the same physical object or reality in different ways. Seeing a physical object in one way or another will not change how that object behaves, only it modifies our understanding of this behavior. Social sciences will be qualitatively different, if for example, as social scientists trying to sketch out a future of ICTs and development through these classes which shape our thinking and practices. .

As Brian Easlea has argued (pages 153-154), the implications for social scientists are quite different:

For the social scientist, the choice between competing social paradigms is not merely one between different images of the existing social reality but, very explicitly, a choice between mutually exclusively future societies. …The fundamental choice confronting social scientists is essentially that between commitment to programmes of “social engineering” within the established structures of power and control or commitment to programmes of revolutionary political action with the intention of building societies significantly less exploitative and manipulative than existing ones

Another important aspect of the social scientist’s endeavor is the act of publishing. The publication of a physical scientist will not for example alter the behavior of elementary particles. Even when a “pure” (as contrasted with “applied”) social scientist publishes research results about the functioning of society, this can lead to altering of social behavior, since the results will carry inscribed values and norms representing a form of desired social future. Thus the publication of research results represents a form of social intervention, and the distinction between pure and applied social science is not as clear as maybe it is in the physical sciences.

In this course, we have disscussed some development theorists like Sen, Castells, Marx and others. We will try to revisit them, in order to understand what would be some implications of understanding better from their perspectives, and how that may inform ICT4D inititatives.

**References**

**Compulsory reading**

Harris, R.W. How ICT4D research fails the poor, Information Technology for Development, 22, 1, 177-192.

Qureshi, S. (2015). Are we making a better world with Information and Communication Technology for Development (ICT4D) Research: Findings from the field and Theory building, Information Technology for Development, 25, 4, 511-522.

Sahay, S. (2016). Are we building a better world with ICTs? Empirically examining this question in the domain of public health in India. Information Technology for Development, 22, (1), 168-176.

Walsham, G. (2012), Are we making a better world with ICTs? Reflections on a future agenda for the field, [*Journal of Information Technology, Vol. 27, Issue 2, pp. 87-93, 2012*](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2185813##)

**Reccomended readings**

Easlea, B. (1973)Liberation and the aims of science: an essay on obsacles to the building of a better world, Cardinal Books, UK.

Walsham, G. (2001) Making a World of Difference: IT in a Global Context, Wiley, UK.

**Schedule**

The course will be conducted over a 4 week period, covering 16 sessions of 3 hours each. There will thus be 4 sessions per week.

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| Module | Date | Time | Topic | Place |
| What do we mean by development? | Mo. 26. Sep | 09:00–12:00 | Overall perspective on development: failure of growth approaches, relevance of Marx | Perl |
| Th. 29. Sep | 09:00–12:00 | Sen’s human development approach | Java |
| Th. 29. Sep | 13:00–16:00 | Castells and the network society | Java |
| What do we mean by ICTs for development? | Mo. 3. Oct. | 09:00–12:00 | The relevance of Marx | Perl |
| Th. 6. Oct | 09:00–12:00 | ICT perspective on development Resilience, self-reliance | Java |
| Th. 6. Oct | 13:00–16:00 | Open source, appropriation and development | Java |
| Analyzing the relation between ICTs and development | Mo. 10. Oct | 09:00–12:00 | Social embeddedness of technology and development Citizen/civil society initiatives | Perl |
| Th. 13. Oct. | 09:00–12:00 | Diffusion, translation, and technology transfer | Java |
| Th. 13. Oct. | 13:00–16:00 | Frugal innovation and development | Java |
| Are ICTs creating a better world? | Mo. 17. Oct | 09:00–12:00 | What do we mean by better? | Perl |
| Th. 20. Oct | 09:00–12:00 | Health and development | Java |
| Th. 20. Oct | 13:00–16:00 | New challenges of development: peace, migration, security, humanitarian issues | Java |