The capability approach and the 'medium of choice': steps towards conceptualising information and communication technologies for development

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Abstract Amartya Sen's capability approach has become increasingly popular in development studies. This paper identifies controllability and operationalisability as two key stumbling blocks which prevent the capability approach from being used even more widely in development practice. It discusses the origins and application of the Choice Framework, a conceptual tool designed to help operationalise the approach. The framework can be used to deconstruct embedded ideologies and analyse the appropriateness of development goals, to map development as a systemic process, and to plan interventions which can result in increased freedom of choice for people. Three examples of the application of the Choice Framework in the field of information and communication for development (ICT4D) are given. The three technologies which are examined, telecentres (Infocentros), Chilecompra and Fair Tracing, can be placed at different places of a determinism continuum, some reducing the spectrum of choices a user has. The paper argues that while frameworks such as the Choice Framework can be developed further to increase the operationalisability of the capability approach, it is up to development funders to accept the fact that people's choices are never fully predictable and thus Sen's 'development as freedom' will inevitably be a dynamic and open-ended process.

Keywords Capability approach · Amartya Sen · ICT4D · ICTD · Internet · Choice · Livelihood framework · Empowerment · Telecentre · Telecenter · Design

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Introduction

The capability approach, stressing people's freedom to choose the lives they have reason to value (Sen 1999), is, arguably, the currently most recognised heterodox development approach. While it has been enthusiastically embraced by many scholars and practitioners, at least two key stumbling blocks to it becoming more widely used in development practice remain. The first is uncontrollability: the structure of the 'development industry' is such that funders tend to be persuaded to commit resources based on the promise of pre-determined impacts, not by a promise that people will be empowered to make much less predictable choices of development outcomes. The second is practical applicability: even if one were to accept expansion of freedom, and thus freedom to choose, as the primary end and principal means of development (Sen 1999:36) then how can the conceptual richness of this approach be translated into an operationalisable modus operandi in development planning, execution and evaluation?

The terminology of choice has also appeared in the literature on knowledge societies and particularly in the discussion of the impact of the internet. Norris has called the internet the 'medium of choice *par excellence*' (2001:24), because of the nature of the medium. Internet access provides the door to an entire world, often called 'cyberspace', in which individuals choose to press the door handle to a new room every time they click a link or type a URL.[1] Access to the internet remains spatially and socially highly uneven, a phenomenon described as digital divides. For those people with access, 'surfing the internet' can be

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[1] It should of course be noted that large sections of the internet can be blocked, password protected or by invitation only, thus locking people out of such rooms.
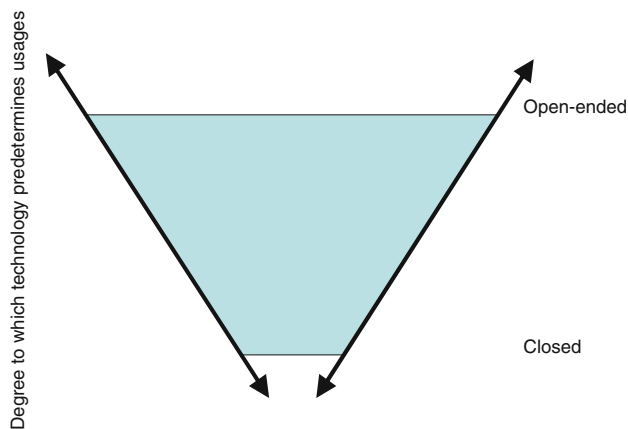
Fig. 1 Determinism continuum

seen as a string of choices that the individual makes. People have then gone on to use the internet for gathering information, reading newspapers, email, chat, Voice-over-IP calling, online shopping, online gaming, remote working, data exchanges, file swapping, blogging et cetera. It is however, important to distinguish between the internet as a space of possibilities—and specific applications which are more directionally defined. Analytically, they can be placed on a determinism continuum, based on the degree to which the spectrum of user choices is already pre-determined by the technology (see Fig. 1).

Internet access itself is obviously much more open-ended in nature than a specific application which lets users vote on, say, two options. Every technological system has a set of norms embedded into it (Lessig 2000) as well as coming with a set of norms on usage (Wajcman 2004). In other words, some decisions are already made long before the user-citizen ever gets a choice. Broadly speaking, the further down on the determinism continuum a specific technology is, the more danger there is that the technology circumscribes the choices of a user-citizen more than that it widens them. New information and communication technologies need to be analysed carefully to see how much choice they leave to the user. The internet may be justly called the 'medium of choice *par excellence*' but within this space of different internet-related technologies and internet-based applications, the landscape of choice is highly uneven.

The internet and the mobile phone are the key base technologies which have inspired a new area of development studies and practice called information and communication technologies for development (ICT4D). Due to the multi-purpose, multi-choice nature of the internet, this area of development studies is particularly well-suited to be a test-case for the choice paradigm in development evaluation, execution and planning. This paper is based on ICT4D research which used Sen's capability approach as a starting point and then proceeded, by way of the literature on livelihoods and empowerment, to develop a framework, the

Choice Framework, which could be used to map and analyse ICT4D development processes. The Choice Framework has been introduced in a short paper elsewhere (Kleine 2010). This paper traces its genesis and situates it within other systemic frameworks analysing the development process, as well as giving concrete examples of how it can be used for analysis and planning.

After explaining the intellectual origins of the Choice Framework in the following section, a section will be devoted to applying the framework to different ICT4D project evaluation and planning scenarios. The potential and limitations of the proposed framework will be discussed before the paper concludes that despite the more detailed conceptual work that is still needed, it is a contribution to the growing interdisciplinary effort to operationalise the capability approach for development planning and action. The systemic pervasiveness and multi-purpose usage character of ICTs make ICT4D a good test case for using the Choice Framework in development work.

Developing the choice framework

The larger research project (Kleine 2007) from which the Choice Framework emerged, originally set out to use Sen's capability approach to development in an ontological way, not aiming to develop a directly applicable methodological tool for analysis. However, as the research moved between three rounds of fieldwork in a community in rural Chile and desk study in London, what emerged was a dialectic of inductive and deductive work which produced the Choice Framework as a result of conceptual mapping and systemic analysis.

In the study, 'development' was understood, based on Sen's version of the capability approach (1980, 1984, 1992, 1999), as a process of expanding the real freedoms that people enjoy to lead the lives they value.[2] In Sen's approach, functionings are the various things a person may value doing and being, such as being adequately nourished, being healthy and playing an active role in their community. In contrast to *achieved* functionings, a person's 'capability' is the combination of functionings that are *feasible* for her to achieve (Sen 1999). Several scholars (e.g. Alkire 2002; Alsop and Heinsohn 2005; Clark 2002; Gigler 2004; Nussbaum 2000; Robeyns 2003a) have attempted to operationalise the approach. The Choice Framework presented in the following section is another such attempt.

Alsop and Heinsohn (2005) link choice with their definition of empowerment—as 'enhancing an individual's or

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[2] Sen's formulation, 'freedoms that people enjoy to lead the lives they *have reason to* value' was consciously altered to avoid the implication that this is largely a *rational* choice.

group's capacity to make effective choices and translate these choices into desired actions and outcomes' (Alsop and Heinsohn 2005:5). In their attempt to use empowerment as a mediating theoretical concept to convert the development paradigm of choice into a construct that is of use to practitioners, Alsop and Heinsohn build a very simple framework (see Fig. 2).

In their understanding, individuals use their agency to navigate an opportunity structure in order to achieve 'degrees of empowerment' which enable development outcomes. Existence of choice, use of choice and achievement of choice are 'degrees of empowerment'. Further, the degree to which a person is empowered depends on her or his individual agency and the existing opportunity structure. Agency is defined as 'the capacity to make meaningful choices (2005:8) and measured by an individual's asset endowment, consisting of 'psychological, informational, organisational, material, social, financial and human' assets (2005:8). These assets, which might also be called resources, are listed, but not defined. An actor's opportunity structure is said to be shaped by the 'presence and operation of the formal and informal institutions' (2005:9) and measured by the presence and operation of laws, social norms and customs. In his critique of Dworkin's work, Sen recognises that resources play a key role in development but argues that 'the translation of resources into the ability to do things does vary substantially from person to person and from community to community' (1984:323). He describes the interplay between

individual agency and social structure when he accepts that interpersonal differences (he lists 'body size, metabolism, temperament') and social conditions co-define a person's ability to translate resources into capabilities (1984:323). Robeyns (2003b:7) argues that resources can be interpreted as capability inputs which, depending on individual conversion factors and structural conditions, can be converted into capabilities.

Alsop and Heinsohn's interpretation of the process of empowerment begins to capture the way individuals use their agency, based on their resource portfolio, to negotiate social structures to obtain choices which may lead them to their desired development outcomes. The double arrows also hint at a systemic, rather than a one-way relationship between elements of the framework. Further, their list of assets, though not further explained, includes non-material assets such as 'psychological, informational, organisational, social and human'. With this they acknowledge that 'social capital' is far from the only 'capital of the poor'.

Another famous systemic framework for mapping development processes featuring double-ended arrows depicting mutual influences is the Sustainable Livelihood Framework (SLF) (DFID 1999) which also recognises, among other elements, a 'livelihood asset' portfolio, and 'policies, institutions and processes' as co-constituent of a process leading to 'development outcomes'. The SLF is based on earlier work on livelihoods (e.g. Bebbington 1999; Chambers and Conway 1992) and used by the UK Department for International

Fig. 2 The process of empowerment (Alsop and Heinsohn 2005)

Fig. 3 The sustainable livelihood framework (DFID 1999)
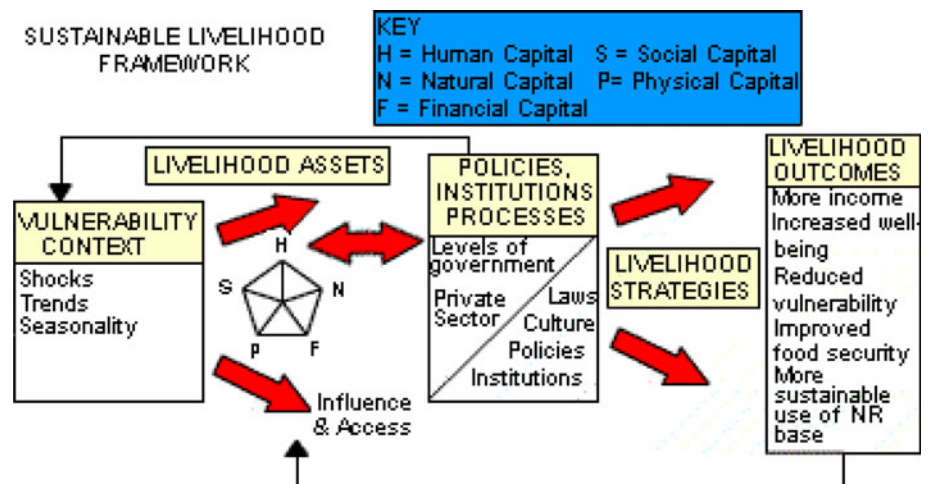
Development (DFID). Its key contribution consists of presenting, in diagrammatic form, development as a process in which different elements influencing the lives of the poor interact in a system. In the SLF (see Fig. 3), individuals operate within a 'vulnerability context' in which they own 'livelihood assets' and negotiate 'policies, institutions, and processes' to develop livelihood strategies to achieve a set of 'livelihood outcomes' (DFID 1999).

Duncombe (2006) has applied the SLF in the context of ICT4D and microentrepreneurs, while Garnham (2000), Mansell (2002), Johnstone (2007), Zheng (2007) and Oosterlaken (2008) are among the scholars who have made the connection between the capability approach, communications, ICTs and ICT4D. Gigler (2004) was perhaps the first to link the SLF with the capability approach and the field of ICT and development. The Choice Framework presented in this paper draws less on the SLF, and more on Alsop and Heinsohn (2005). It is conceptually based on the structure-agency dialectic, link to empowerment and nuanced view of choice of Alsop and Heinsohn's work, taking from the SLF mainly the idea of a capital portfolio and elements of its visual representation. Also, while the SLF includes five capitals—'human capital, natural capital, financial capital, social capital and physical capital', Alsop and Heinsohn offer a longer list of seven assets which in the Choice Framework is extended to ten.
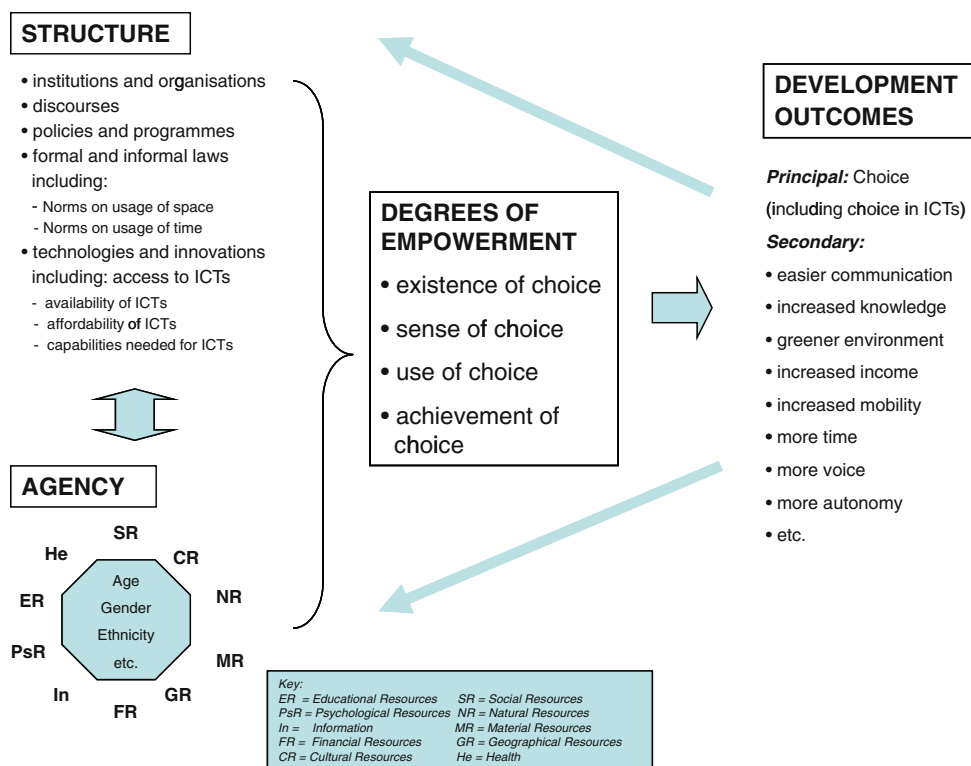
Figure 4 shows the Choice Framework. Its layout suggests that individuals can, with the help of their resource portfolios, negotiate a social structure in order to achieve, by means of their active choices, the development outcomes they aspire to. The following section will explain each element in turn.

Outcomes

There are primary and secondary outcomes. Sen (1999) explains how choice is both the aim and principal means of development and so choice is the primary development outcome. Secondary outcomes will vary from person to person, depending on what kind of life an individual values. The lives we value are complex to describe and so will often be either sketches of overarching aims or limited to aspects relevant to a given context. In the context of research on ICT, people may mention that they value a life in which they have, for example, easier communication with family and friends, times saved and thus freed up, increased knowledge or more income. Capabilities are notoriously difficult to capture systematically. Like many other studies (see review in Robeyns 2003b), this research did not measure capabilities directly, though in interviews and focus groups some aspects of people's capability sets became evident. Capabilities become most obvious when they appear indirectly as partly or fully achieved functionings in the outcome component of the Choice Framework. True to Sen's approach, an analysis based on the Choice Framework would then work backwards: Starting from the outcomes as proxy for an individual's choices it will map the systemic relationships between agency, structure and choice which have led to these

Fig. 4 The Choice Framework (Kleine, based on Alsop and Heinsohn 2005; DFID 1999)

STRUCTURE

- institutions and organisations
- discourses
- policies and programmes
- formal and informal laws
  including:
  - Norms on usage of space
  - Norms on usage of time
- technologies and innovations
  including: access to ICTs
  - availability of ICTs
  - affordability of ICTs
  - capabilities needed for ICTs

AGENCY

SR
He
CR
ER
Age
Gender
Ethnicity
etc.
NR
PsR
MR
In
GR
FR

DEGREES OF EMPOWERMENT

- existence of choice
- sense of choice
- use of choice
- achievement of choice

DEVELOPMENT OUTCOMES

Principal: Choice
(including choice in ICTs)

Secondary:
- easier communication
- increased knowledge
- greener environment
- increased income
- increased mobility
- more time
- more voice
- more autonomy
- etc.

Key:
ER = Educational Resources   SR = Social Resources
PsR = Psychological Resources NR = Natural Resources
In = Information   MR = Material Resources
FR = Financial Resources   GR = Geographical Resources
CR = Cultural Resources   He = Health

outcomes. In addition, the qualitative data may also include mention of the hoped-for, but not achieved outcomes, thus giving another indication of capabilities. These pieces of the puzzle would then form a picture of a system, a snapshot of an ongoing process which might give clues as to which elements of the system might be changed in order to affect positive change to the process.

Agency

In the systemic analysis of the Choice Framework, individuals use their agency to navigate social structures which they have co-created and are constantly co-creating (Giddens 1984). In a given social context with certain axes of exclusion, an individual's personal characteristics such as age, gender, ethnicity etc. are forcefully aligned on these axes and this can affect the scale of their resource portfolio. The resource portfolio which every individual has consists of ten kinds of resources (see Box). Alsop and Heinsohn (2005) placed resources at the core of their conceptualisation of individual agency, but included a more limited list. The ten types of resources identified here—material, financial, natural, geographical, psychological, cultural, social, and educational resources; health; and information—represent an attempt to capture the agency element of the systemic framework in a holistic way. It also recognises that it is not just 'social capital' which can be seen as 'the capital of the poor'. There are a variety of resources which co-occur unevenly with material and financial resources, in other words materially poor people are often rich in other resources. More research needs to be done in this area, for example exploring the complex relationship between psychological resources and material resources. In any case, recognising how poor people are rich in a variety of resources can form an important cornerstone in the process of expanding their capabilities.

Resources can, depending on individual conversion factors, structural conditions, and crucially, an individual's own choices, be converted into capabilities. In this, the individual's ability to choose is crucial. Indeed, this freedom to choose does not just have instrumental value (individuals may know their own needs and wants better than development experts) but also intrinsic value (being able to pursue one's own choices is part of being fully human). Sen uses the term "agency freedom" which he defines as "what the person is free to do and achieve in pursuit of whatever goals or values he or she regards as important" (1985:203). However, he also points out that "the freedom of agency that we individually have is inescapably qualified and constrained by the social, political and economic opportunities that are available to us" (1999, xi–xii). This is an acceptance that both agency and structure matter, and we would go beyond this constraining

view of structure to argue, with Giddens, that agency and structure are co-created and are constantly co-creating. As a result, both have a prominent space in the Choice Framework. Having discussed agency, the following section focuses on the structure aspect of the framework.

Material resources: These sum up the material objects owned, including tools, hardware, machinery and other equipment. They are also essential inputs in the production process.

Natural resources: This includes issues such as geomorphologic and climatic conditions in a locality and related aspects such as soil quality, naturally available resources and access to water as well as the attractiveness of the surrounding nature.

Geographical resources: Covers the practical implications of location and relative distances, and also includes the intangible qualities of a location.

Human Resources: The term 'human resources' has been used for decades in the economics and industrial relations literature. In the Choice Framework, this term needs to be disaggregated into health and education and skills (educational resources). Within Sen's paradigm of development, good health is a prerequisite for a person's ability to choose the life she/he values. Educational resources represent education and skills acquired through formal and informal means.

Psychological resources: Alsop and Heinsohn (2005) recognise the significance of 'psychological assets' and give as an example 'capacity to envision'. More broadly, psychological assets may include self-confidence, tenacity, optimism, creativity and resilience. Spirituality or religious beliefs stand in complex interrelation with psychological resources—they can strengthen or weaken an individual's psychological resources.

Information: Alsop and Heinsohn list informational assets as a key resource. Heeks (1999) calls for putting information at the centre for analysis of ICTs and Development, and Gigler (2004), adds 'informational capital' to the capital portfolio. Access to information is the first step to knowledge acquisition, the process of filtering and transforming information into meaningful knowledge.

Cultural resources: 'Cultural capital'—which in the Choice Framework is called cultural resources—exists, according to Bourdieu (1986), in three states: an embodied state (the *habitus* a particular person lives in); an objectified state (objects like paintings, instruments and monuments which only the initiated can use or appreciate); and an institutionalised state (prestige attached to, for example, academic titles or leadership roles).

Social resources: 'Social capital'—or social resources—is included in both the SLF and Alsop and Heinsohn's work. It has been both immensely influential and highly contested in development discourse (Harriss 2001). For the Choice Framework, Bourdieu's definition of social capital is used:

'the aggregate of the actual and potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition—or in other words, to membership in a group— which provides each of its members with the backing of the collectivity-owned capital, a 'credential' which entitles them to credit, in the various senses of the word.' (1986, p. 249)

Membership of these groups can be defined by kinship, friendship, shared ethnicity or class, or informal commonality ties.

Structure

Both Alsop and Heinsohn's empowerment framework and the DFID SLF recognise not only individual agency, but also social structures which aid or constrain this agency. Alsop and Heinsohn refer to elements of this structure as 'formal and informal laws, regulations, norms and customs' (2005:9) and the DFID SLF speaks of laws and 'culture'.[3] Further, the SLF includes not only laws, but also policies, institutions and processes. The Choice Framework includes 'institutions and organisations, policies and programmes, formal and informal laws'. Since rules, laws, norms and policies are embedded in, and often emanate from discourses, discourses are included as part of the structure element. They are no less potent: hegemonic discourses can limit the thinkspaces in which social structures are negotiated and created and can also have a powerful effect on an individual's sense of choice.

Informal and formal norms can regulate people's behaviour based on gender, age, ethnicity, income, class, sexual orientation, religious background or other axes of exclusion. As feminist scholars have pointed out, in many societies there are gendered informal norms which dictate how men and women make use of their time and which spaces they access when. This can limit a person's freedom to live the life she or he values.

When analysing technologies and innovations as elements of the structure, uneven access to technology is a key obstacle. Gerster and Zimmermann (2003:9) distinguish three different dimensions of access: connectivity, affordability and capabilities needed for using different technologies. In this paper, the first will be widened in meaning from "connectivity" to "availability" and the latter will be replaced with 'skills' in order to avoid confusion with Sen's use of the word 'capabilities'. These dimensions of access are path dependent and embedded in other elements of the structure, for example availability and affordability will be linked to other existing infrastructures and the regulatory environment.

These structural factors relate in complex ways to the agency element of the Choice Framework. For example, a person with higher educational resources (including IT skills) and information might find it easier to use the internet access facilities on offer, which she may use to gain more information and more IT skills. Her skills base plus the information she has may put her in a position to email her local authority or organise a group to lobby for improved internet access. Thus individuals can use their agency to negotiate the structures and in doing so may both extend their agency and co-construct, alone or with others,

changes to the structure. Structural constraints need to be recognized as being at least as important an element in the process as individual agency, but ultimately, and particularly in democratic societies, structures are always co-constructed by a number of individuals. However, in the negotiation and creation of structure, power is not equally distributed, so that the individuals most influential in creating specific institutions, discourses, norms etc. are often not the ones most affected by them.

Dimensions of choice

Individuals use their resource-based agency to negotiate the social structure, constantly making choices generally aimed at their notion of what kind of life they want to live. According to Sen, the aim of development is to expand this freedom to choose. Alsop and Heinsohn conceptualise choice in three dimensions, which they call 'degrees of empowerment': (a) the existence of choice—whether the different possibilities exist and are, in principle, attainable for the individual if the combination of their resource portfolio and the structural conditions would allow it; (c) the 'use of choice'—whether or not an individual actually makes the choice and (d) the 'achievement of choice'—whether the outcome matches the choice expressed. In the Choice Framework, another dimension is added, logically situated between existence and use of choice. During fieldwork experiences (see Kleine 2007) it became evident that just because a choice existed did not mean people had a sense that it was available for them to choose. For example, in relation to new ICT, people in rural Chile were aware of some possibilities the new technology offered them, like email and online chat, but not of others, like Voice-over-IP. The dominant discourse in the Chilean media, and indeed the state-funded computer courses, focussed on some usages over others, thus affecting people's sense of choice. Sense of choice plays a key role in understanding individual decision making generally. It is particularly pertinent in relation to research on technological or social innovation where people may be challenged to imagine the unknown and not-yet-experienced.

Applying the choice framework to development, in particular ICT4D

The Choice Framework is another attempt to operationalise the capability approach in a holistic and systemic way, thus maintaining much of its conceptual richness. It helps map complex development processes in which individuals use their resource portfolio to negotiate a given social structure in order to make the choices which bring them closer to the lives they value. This is an ongoing process, in which many

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[3] This runs the risk of becoming a kind of black box into which all issues pertaining to a local context are grouped together.

outcomes are never fully, but gradually achieved—they remain dynamic. According to the paradigm of the capability approach, in this process, the primary development outcome remains freedom of choice itself. This is another dynamic 'process outcome', not a static 'product outcome'.

This perspective poses a twofold challenge to the current impact-focus of development planning: Firstly, if it is individuals, or groups of individuals, deciding what they want to achieve as a development outcome, development remains an open-ended proposition and hard to measure by a priori impact measures. Participatory planning processes and participatory monitoring and evaluation go some way in addressing this challenge. The second challenge is that an emphasis on process outcomes as well as product outcomes means that development is an ongoing process which by definition is never finished. In this view, all countries remain developing countries with communities, groups and individuals all developing. Development projects then need to be seen as, at best, catalysts in an ongoing process towards achievement of certain outcomes. Some of these chosen outcomes, like degrees of literacy attained in a particular alphabetical system, can be tested for, measured and fully accomplished, while others, like "good education", are hard to define and can by definition never be fully achieved, but still are fundamentally important.

The Choice Framework may prove a useful way of operationalising Sen's approach for development work. There is no reason why it could not be applied to any specific sector of development work or studies. In the following section, it will be applied to the area of information and communication technologies for development (ICT4D) and in particular, the 'medium of choice *par excellence*', the internet.

There are three key ways in which the Choice Framework can be used in analysing technology: (1) Deconstructing embedded ideologies and analysing goals; (2) Systemic Mapping; (3) Planning for Choice.

Deconstructing embedded ideologies and analysing goals

As discussed above, ideas and ideological principles (e.g. hierarchy, democracy, exclusiveness/inclusiveness, open market, transparency, individualism, collective action etc.) are embedded, explicitly but more often implicitly, in every technology. Technologies can also be placed on a determinism continuum, depending how tightly prescribed their usage is. Sen's approach with its emphasis on the freedom of choice allows us to identify firstly, what the embedded ideologies in a particular technology are and how they relate to freedom of choice. Secondly, we can recognise that the less flexible and further down on the determinism continuum a technology is, the less it will allow for increased choice to be

the primary outcome of its use and it falls to us to analyse whether the secondary outcome of its use coincides with the choice of the individual user. So for example, a telecentre providing state-funded internet access free and unrestricted at the point of access is a bundle of technologies which have ideological principles such as social inclusion, access to information as a public good, democratic access and multi-purpose use according to individual's choices embedded in it. This is broadly compatible with a development approach centered around freedom of choice. Telecentres are also very far up on the determinism continuum, suggesting a wide range of uses are open to the individual. There is therefore less risk that the goals of the individual and those of the technological intervention do not overlap.

Apart from telecentres, the Chilean study this paper draws on (Kleine 2007) also looked at the e-procurement system *Chilecompra*. Upon analysis, it became clear that the ideological principles it was based on were an open-market economy, transparency and maximising competition between vendors (Kleine 2009). Local public servants operating the system in the name of the local community of tax payers exercised choice in procurement. This choice was aided by the increase in transparency the system offered. However, the fact that firstly, local microenterprises were excluded by the system because of their lack of access to technology and lack of skills, and that secondly the undue emphasis on price led to price wars at the expense of quality, actually reduced the choices that local public servants had. Indeed, it was not possible to translate aspects of the life that people wanted to live, like having local jobs and an intact environment, into procurement choices, because of the econocentric emphasis written into the system. This was linked to the *Chilecompra* system's position on the determinism continuum—it was very far down towards the more fixed-purpose technologies. Thus there was an increased risk that the predetermined direction the system was geared to was not sufficiently overlapping with the choices users would have made without the system. Arguably, local people and their representatives would have sought to use procurement in a way that balanced price criteria with the social and environmental impact particular products came with. They would certainly not have wanted to exclude local microentrepreneurs.

Systemic mapping

The second way in which Sen's approach and the Choice Framework can be applied to ICT4D is to use it to map the complex influence ICTs, particularly the internet, have on development processes. To address the social structure element first: ICTs have changed the way institutions and organisations, such as the media, local authorities and businesses operate, and to engage fully with these, citizens

and consumers need to use the technologies. Policies and programmes may include state ICT policies which may shape the structure of access to these technologies. ICTs come with formal and informal laws, ranging from laws in digital signatures to informal rules governing email use. Access to ICTs is framed by the norms of the usage of space and use of time. Most directly, the availability, affordability and skills needed to use ICTs have caused digital divides which often follow existing social divides.

On the agency side, material resources may include computer hardware and software, while financial resources define the ability to pay for home access or cybercafé visits. Internet backbone infrastructure opens up a new perspective on geographical resources. Access to the internet helps a person obtain information and affects their educational, social and potentially psychological and cultural capital. Likewise, a certain amount of educational resources (literacy, IT skills) is needed, as well as health and psychological resources, to make use of the internet.

This shows clearly how ICTs are affecting the resources co-defining a person's agency as well as they are changing the social structure which the individual has to navigate in order to reach the degree of empowerment which will let them achieve the desired outcomes. This is the indirect systemic influence of ICTs. There is also a direct influence: While people rarely choose 'use of the internet' as an outcome in itself, outcomes such as 'easier communication' and 'increased knowledge' may be more easily achieved if a person chooses to use the internet. Or, more specifically, is aware of the existence of choice, senses that this choice is available to them, makes use of this choice and achieves the choice.

To use an example from the larger study (Kleine 2007), Marta Castillo[4] was an income-poor single mother who ran a small catering business and did not have the **material resources** to own a computer nor the **financial resources** to pay for regular visits to the local cybercafé. She combined her **educational resources** (literacy, state funded IT training), her **geographical resources** (proximity to the cybercafé), her **psychological resources** (confidence, patience), her **social resources** (acquaintance with the telecentre director) and **information** about opening times and used these to navigate the **social structure** she was engaged in. The way ICTs had affected the **social structure** meant that publishers of cookery books and magazines now published some recipes online and that state **policy** was to provide free access to the internet to citizens via telecentres online and free basic IT courses. Gendered **norms on space** meant that the telecentre adjacent to the public library was a more socially acceptable place to be for a middle-aged woman than the youth-club like cybercafé. Gendered **norms on the usage of time** might have

forced married women to stay at home until housework was done but as a single and self-employed woman Marta did not have any of these restraints placed on her. Her overall aim was to sustain an income for her family and to pay for the further and higher education of her children. She was keen to download new recipes for diabetics to allow her to cater for a specific set of customers. She knew the recipes were available for free online and **sensed** that the **choice** of using the internet in the telecentre was open to her. She **used her choice** and **achieved** it, allowing her to obtain the intended **outcome**: increased knowledge of recipes for diabetics which in turn relates to her overall objective of securing the family income.

Marta's case is an example of how the Choice Framework can help guide the analysis of how ICTs affect, at various points in the system, an individual's development process. This systemic mapping is the second way in which the framework can be used in the context of ICT4D.

Planning for choice

After having used the Choice Framework as a tool for analysis, the third way to apply it focuses on a pro-active use of it in development planning. This would mean in the field of ICT4D that firstly, what we are aiming for is broadly defined by the choices of users as to what lives they value. Secondly, the Choice Framework can be used as a mapping tool to identify at which points a socio-technological intervention might empower individuals by affecting change to either their resource portfolio or the social structure, or both. Thirdly, there needs to be an awareness that the technologies we are creating carry embedded ideologies within them which need to be subject to scrutiny so that users can at the very least recognise what choices have already been made for them if they choose to use a particular technology. Fourthly, it means that the further down the determinism continuum a particular technology is—in other words, the more users' choices will later be locked in by the technology, the more the users' choices must already be integrated in the design process.

All of these pose an ongoing challenge, and I can only report on it from an action research project I have recently been involved in. To complicate matters, this was an interdisciplinary project involving nine researchers in political science, computer science and development geography at six institutions in three different countries, so the perspective portrayed here is only my own.

The Fair Tracing project was intended to use tracking and tracing technologies on products to give consumers and producers more information about the social and environmental aspects of goods and their value chains. It was intended to empower consumers in their buying choices and producers in their decisions in production and

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[4] Name changed.

trading. Fair Tracing used technology of barcode scanning mobile phones to link a product on the supermarket shelf, specifically Fairtrade Chilean Wine and Indian coffee, with an online database containing information about the product's organic or Fairtrade certification, information on who received how much in the value chain and audio and video in which producers explained the production process and where the Fairtrade Fund was spent.

As one of the researchers, I approached this project with a development paradigm of 'development as freedom to choose the lives they value' in mind and so could apply the Choice Framework in the planning and analysis of this action research project. *Firstly,* what we were aiming for, empowering consumers and producers in their decision making, was broadly in line with the approach. *Secondly,* our intention was to increase, in the terminology of the Choice Framework, the resource portfolio of consumers by increasing their **information**, and changing the **social structure** by supporting, alongside other initiatives, the public **discourse** in the UK which demanded more information about the origin of food in supermarkets. The website we set up (www.fairtracing.org) and the network of 11 similar projects we later co-founded—the Ethical Consumer Information System—were new **institutions** which had not previously existed online. Using these **institutions** together with their new **information,** UK consumers could better develop their knowledge of the **existence of choice, their sense of choice, their use and achievement of choice** to achieve what consumers had expressed, in participatory research, as their chosen **outcome**: 'supporting the right people in the right way'.

By taking part in a participatory mapping exercise, producers shared, and thus increased, their **information** about the value chains they operated in, improving their understanding of the **existence of choices** of trading partners and their **sense of choice.** They then decided to **use their choice** and remain with existing trading partners instead of changing trading partners. Being able to create their own stories and short videos allowed the Chilean wine producers to use the **access to ICTs** on offer and the new website to maximise their **psychological resources** (confidence) and **cultural resources** (knowledge about wine, *habitus* as knowledgeable producers) while passing on **information** to consumers. In return, consumers were enabled, through their buying decisions, to pass **financial resources** to the producers. Thus the systemic logic of the Choice Framework made it possible to analyse the multiple systemic effects the socio-technical intervention had on the development process.

Recognising what ideologies were embedded in the technologies we were using was a challenge. The internet itself arguably carries the values of the 1960s US-American campus cultures where its basic technologies originated (Castells 2000), such as personal liberty,
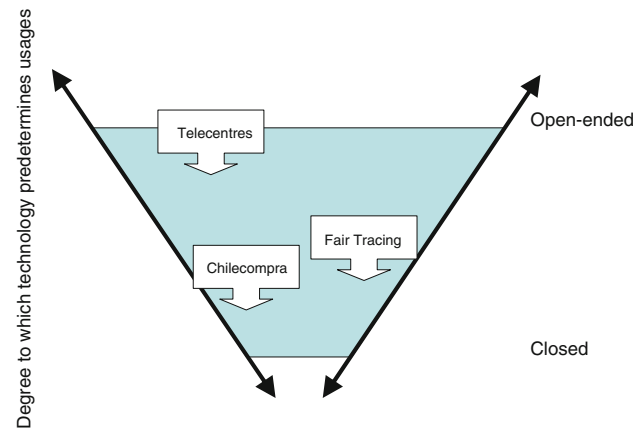
Fig. 5 Placing the three examples in the determinism continuum

individualism, consumer empowerment and flat hierarchies. Our Fair Tracing website further implied principles such as transparency and understood price as consisting not just of the economic, but also the social and environmental cost. This in turn was related to an understanding of sustainability routed in the Agenda 21 which sought to balance economic, social and ecological factors. Choosing high-end mobile phones which could read barcodes and using a website as the key information platform meant that our project also replicated, to a degree, norms of access summed up in the concept of 'digital divides', excluding people who did not have access to these technologies. We mitigated to a degree by allowing users to type in barcodes as well as scanning them but found it technically difficult to move away from the website as the main platform.

Finally, the Fair Tracing technology needed to be analytically placed on the determinism continuum (see Fig. 5) to see to what degree it would be multi-purpose or would limit the choices of users to a narrow set of purposeful uses.

By deciding to keep the program code open source we used the medium's specific ability to allow itself to be moulded by technically proficient users. However overall, the use was quite specific and thus we needed to involve producers and consumers in the design from a very early stage, earlier than would have been necessary if we had been developing a more multi-purpose technology. In designing, we aimed to use participatory methods to establish the development outcomes that consumers and producers were aiming for, and then worked backwards to strengthen their existence, sense, use and achievement of choice by influencing key elements of the resource portfolio and the social structure. In this project, it was particularly the use of technology to shift information into the hands of those making choices which affected the system.[5]

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[5] For more information on the methodology of the Fair Tracing project, see Kleine (2008), Light et al. (2009).

Potential and limitations of the choice framework

The above examples were chosen to illustrate how the Choice Framework could be used to translate the conceptual complexity and richness of the capability approach into the more micro- and meso-level of research work and project planning. It is important to note that many scholars are working on doing just that and many different useful frameworks exist. The scale of the intellectual task is such that this will require many minds from many different disciplines, thinking broadly in the same direction while contributing their disciplinary viewpoint. The Choice Framework is one of these contributions, emerging from the field of ICT4D but with possible relevance to other areas. Its potential lies in three forms of usage.

Like the capability approach itself, it can be used as a kind of directional litmus test, checking how technologies, and indeed more widely development projects and programmes, have, explicitly and implicitly, ideologies embedded within them. Technologies or projects professing an understanding of development as freedom should then indeed be geared towards increasing, and not limiting, people's choices to lead the lives they value.

Secondly, the Choice Framework can be used to see development processes as systemic and to analyse such systems starting from the development outcomes chosen by the people themselves. It allows us to see the complexity of interventions in systems while placing choice firmly at the centre of process analysis.

Thirdly, the Choice Framework can be used not only as a tool of analysis, but also for development planning for choice. Desired outcomes can be defined in a participatory way and then the analysis can start of which points in the system interventions need to be focused on.

However, several challenges for the Choice Framework remain outstanding, of which I will only list one for each of the key usages.

Deconstructing embedded ideologies of development and analysing goals

It is certainly useful to analyse the understandings of development embedded in existing projects, programmes or technologies. However, as long as the capability approach remains a heterodox approach, most development projects will not be a priori aligned with an understanding of development as freedom. It thus becomes debatable whether the effectiveness of a project should be judged against an understanding of development which it was not designed for. Thus, such scrutiny works best in cases in which there is already an explicit or implicit invocation of the capability approach.

Systemic mapping

The Choice Framework rather boldly aims to be a comprehensive map of systemic development processes and as such it has been impossible to conceptualise each element of the framework to a sufficient depth. Below many elements, such as social resources, lie extensive theoretical literatures, and their complexities have not been sufficiently discussed so far. It clearly needs further conceptual work, and such work would need to be an interdisciplinary effort, with for example economists offering more insights into financial resources, sociologist into institutions, psychologists into psychological resources and so on. It would also make sense to customize which elements to theorise in more depth depending on the area of intervention. This will co-determine which elements of the framework are most relevant in the specific case. In the area of ICT4D, for example, information plays a prominent role while other resources are also relevant.

Planning for choice

The Choice Framework could be productively used in planning development projects shifting the focus from a priori defined impacts to entitlements and empowerment, as demanded by Mansell (2006) and others. Individuals could be empowered to choose for themselves what kind of lives they valued. Building on this and working in a sense *backwards*, elements of the framework could be singled out for intervention. Outcomes would not be a priori written into funding proposals but desired outcomes would emerge in partnership with local users. Where unexpected effects occurred, as they frequently do, their desirability would be measured against the outcome aspirations of the individual or group of individuals. While this way of thinking is closely aligned with the principle of development as freedom, it flies in the face of most development funding processes at the moment, where funds are allocated with a view to a priori defined impacts and measurable targets.

ICT4D has struggled with the linear impact model of development funding for some time (Mansell 2006). Some technologies, such as the internet or mobile phone, are multi-purpose technologies located on the open-endedness space of the determinism continuum. This, and the pervasive nature of the technologies affecting various aspects of society and economy and thus various sectors of development work, has meant that ICT4D practitioners have struggled to provide funders with either narrow a priori impact predictions or achieved measurable targets (beyond crude input targets). ICT4D is thus particularly well suited to act as a test case for a model of the development process as open-ended and focused on the choices people make themselves.

Conclusion

The internet can be seen as the 'medium of choice *par excellence*' in principle, but different related technologies and applications sit at different places in the determinism continuum. An analysis of the three examples, telecentres, *Chilecompra* and the Fair Tracing project, places the telecentres at the open end of the determinism continuum, while Fair Tracing sits towards the middle and Chilecompra towards the closed end. In order for technology to aid people to achieve their chosen development outcomes, the latter two in particular would have to ensure that the norms and ideas inscribed in the technology reflect people's choices.

The introduction highlighted two key reasons why Sen's capability approach is still not as fully embraced by development funders as it could be: the issues of practical applicability and controllability. The Choice Framework offers a suggestion as to how the capability approach could be applied in practice—both in analysis and planning of projects. As far as controllability is concerned, thinking development as freedom clearly poses a challenge to funders to conceptualise development processes as systemic, dynamic and open-ended. This requires risk taking on the part of funders, but ultimately means trusting people to be empowered agents of their own development.

References

Alkire, S. (2002). *Valuing freedoms*. Oxford: Oxford University Press.

Alsop, R., & Heinsohn, N. (2005). *Measuring empowerment in practice—Structuring analysis and framing indicators*. Washington, D.C.: World Bank.

Bebbington, A. J. (1999). Capitals and capabilities: A framework for analysing peasant viability, rural livelihoods and poverty. *World Development, 27*(12), 2021–2044.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). New York: Greenwood Press.

Castells, M. (2000). *The information age: Economy, society and culture: The rise of the network society*. Oxford: Blackwell.

Chambers, R., & Conway, G. R. (1992). *'Sustainable rural livelihoods: Practical concepts for the 21st century'. Discussion Paper 296*. Brighton: Institute of Development Studies.

Clark, D. (2002). *Visions of development*. Cheltenham: Edward Elgar.

DFID. (1999). *Sustainable livelihoods guidance sheets*. London: Department for International Development.

Duncombe, R. (2006). Using the livelihoods framework to analyse ict applications for poverty reduction through microenterprise. *Information Technologies and International Development, 3*(3), 81–100.

Garnham, N. (2000). Amartya Sen's "Capabilities" approach to the evaluation of welfare and its applications to communications. In B. Cammaerts & J. C. Burgelmans (Eds.), *Beyond competition: Broadening the scope of telecommunications policy* (pp. 25–36). Brussels: VUB University Press.

Gerster, R., & Zimmermann, S. (2003). *Information and communication technologies (ICTs) for poverty reduction? Discussion Paper*. Bern: Swiss Agency for Development Cooperation.

Giddens, A. (1984). *The constitution of society*. Cambridge: Polity Press.

Gigler, B.-S. (2004). *Including the excluded—Can ICTs empower poor communities? Towards an alternative evaluation framework based on the capability approach*, Paper presented at Fourth International Conference on the Capability Approach, Pavia, Italy (5–7 September).

Harriss, J. (2001). *Depoliticizing development—The World Bank and social capital*. London: Anthem Press.

Heeks, R. (1999). *Information and communication technologies, poverty and development. Development Informatics Working Paper No. 5*. Manchester: IDPM.

Johnstone, J. (2007). Technology as empowerment: A capability approach to computer ethics. *Ethics and Information Technology, 9*, 73–87.

Kleine, D. (2007). *Empowerment and the limits of choice: Microentrepreneurs, information and communication technologies and state policies in Chile*, (unpublished PhD thesis). Department of Geography and Environment, London, London School of Economics and Political Science.

Kleine, D. (2008). Negotiating partnerships, understanding power: Doing action research on Chilean Fairtrade wine value chains. *The Geographical Journal, 174*(2), 95–191.

Kleine, D. (2009). The ideology behind the technology—Chilean microentrepreneurs and public ICT policies. *Geoforum, 40*, 171–183.

Kleine, D. (2010). ICT4What? Using the Choice Framework to operalitionalise the capability approach to development. *Journal of International Development, 22*(5), 674–692.

Lessig, L. (2000). *Code and other laws of cyberspace*. New York: Basic Books.

Light, A., Kleine, D., & Vivent, M. (2009). Performing Charlotte: A tool to bridge cultures in participatory design. *International Journal of Sociotechnology and Knowledge Development, 2*(1), 36–58. (forthcoming).

Mansell, R. (2002). From digital divides to digital entitlements in knowledge societies. *Current Sociology, 50*(3), 407–426.

Mansell, R. (2006). Ambiguous connections: Entitlements and responsibilities of global networking. *Journal of International Development, 18*(6), 901–913.

Norris, P. (2001). *Digital divide–Civic engagement, information poverty, and the internet worldwide*. Cambridge, MA: Harvard University Press.

Nussbaum, M. (2000). *Women and human development: The capabilities approach*. Cambridge: Cambridge University Press.

Oosterlaken, I. (2008). *Product innovation for human development; A capability approach to designing for the bottom of the pyramid*. Working Paper of the 3TU.Centre for Ethics and Technology. Delft: Delft University of Technology.

Robeyns, I. (2003a). Sen's capabilities approach and gender inequality: Selecting relevant capabilities. *Feminist Economics, 9*(2/3), 61–92.

Robeyns, I. (2003b). *The capabilities approach: An interdisciplinary introduction*. Department of Political Science and Amsterdam

School of Social Sciences Research Working Paper, University of Amsterdam, Amsterdam.

Sen, A. (1980). Equality of what? In S. McMurrin (Ed.), *The Tanner Lectures on human values* (Vol. 1, pp. 197–220). Salt Lake City: University of Utah Press.

Sen, A. (1984). *Resources, values and development*. Cambridge, MA: Harvard University Press.

Sen, A. (1985). Well-being, agency and freedom: The Dewey Lectures 1984. *The Journal of Philosophy, 82*(4), 169–221.

Sen, A. (1992). *Inequality re-examined*. Oxford: Clarendon Press.

Sen, A. (1999). *Development as freedom*. Oxford: Oxford University Press.

Wajcman, J. (2004). *Technofeminism*. Oxford: Polity Press.

Zheng, Y. (2007). *Exploring the value of the capability approach for e-development*'. Paper presented at the 9th International Conference on Social Implications of Computers in Developing Countries. Sao Paulo, Brazil, (28–30 May).