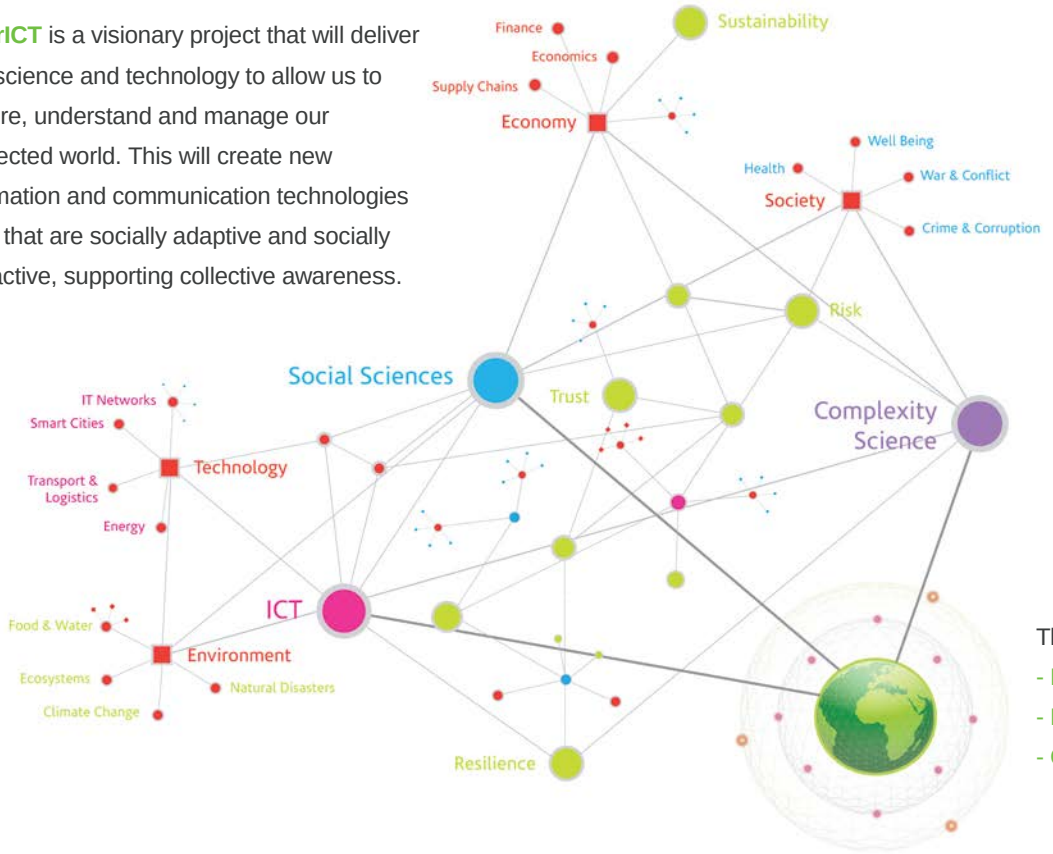
FuturICT is a visionary project that will deliver new science and technology to allow us to explore, understand and manage our connected world. This will create new information and communication technologies (ICT) that are socially adaptive and socially interactive, supporting collective awareness.



The FuturICT Platform:

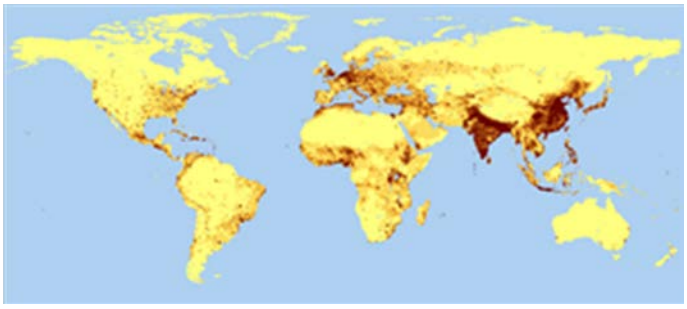
- Planetary Nervous System
- Living Earth Simulator
- Global Participatory Platform

Migration and Global Demographics Observatory

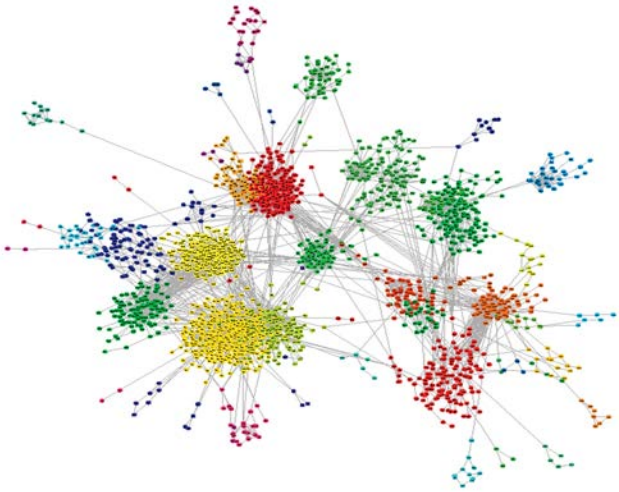
FuturICT will build a sophisticated framework for simulation, visualisation and participation, called the FuturICT Platform. A suite of models forming the Living Earth Simulator will power Observatories, to detect and mitigate crises plus identify opportunities in specific areas. These models will be driven, and calibrated, by data aggregated in real-time, which are gathered by a digital Planetary Nervous System. Both models and data will support the decision-making of policy-makers, business people and citizens, through a Global Participatory Platform which is intended to facilitate better social, economic and political participation. Exploring interactions among society, technology, environment and the economy will promote innovation.

The Migration and Global Demographics Observatory will embrace the modelling of past and future global population distribution, and in particular of international migration flows. Within a context of an expanding global population and rapidly changing economic dynamics across the world, migration is likely to remain a key phenomena shaping future societal outcomes in world regions of origin and destination. The Migration and Global Demographics Observatory within FuturICT will develop innovative models to predict plausible future scenarios for migration and population natural change across a range of geographical scales and tightly coupled with those developed by the other observatories, in particular finance and economics, security, energy, food and water.

The first phase in the building of the Migration and Global Demographics Observatory will consist in the collection of basic demographic indicators at country level, such as population counts, fertility, mortality, and gender & age structure, as well as migration stocks and flows. These migration figures will be broken down by migration type (economic/level of skill, students, refugees, family reunification, visitors, etc.) and origin- destination country pairs following different definitions of migrants available (country of birth, nationality, length of stay). Where data availability permits these will be collected from national and international statistical organisations and where some of these dimensions and variables are not available, synthetic data will be estimated based on robust and established methodologies in demography. The demographic database will be built keeping a dual perspective for every migration flow and stock, that is, that of both the perspective of the sending and receiving country. The important fact that every immigrant is also an emigrant somewhere seems to pass unnoticed in official migration statistics. Attempts to reconcile these two perspectives will be explored, and confidence intervals around estimated sizes of flows and stocks will be arrived at, with a view at modelling an enclosed global demographic system.



2010 Worldmap of population density
Source: Ciesin, Columbia University



Ethnicity clusters in people's names
Source: Mateos, Longley, O'Sullivan (2011) PloS ONE

Predicting population geographic distribution and global dynamics

The second phase of the project will entail the building of demographic and migration models of stocks and flows following key theories and factors described in the literature: push-pull factors, intervening obstacles, wage disparities, segmented labour markets, new economics of migration (market failures), social networks, post-colonial networks, and so forth. At a later stage, constraints will be introduced in these models such as the size of economy and labour markets, total 'population capacity', or housing stock, to explore the behaviour of the whole global system. The interpretation of these analyses will describe the major migration and demographic dynamics over the past decades with a view to model future scenarios. An important innovation will be to identify unexpected shifts in past migration flows exploring associations with other socioeconomic variables and observatories within FuturICT that might not have been identified by the migration and population studies literature. These insights will be used to develop initial prototypes of migration models for different world regions, which will be then improved in collaboration with the other FuturICT work streams adding predictive power.

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