



Context: challenges



Technology Innovation for Sustainable Development

Hello! In the last video, we have seen three of the five main challenges we have to face when developing technology innovation for low and middle income countries: a lack of quality infrastructure, a lack of trained personnel, and a lack of financial resources. Let us now discuss the challenge of harsh environment.

Notes

Summary



0m 12s



This picture was taken in a hospital in Cameroon. It shows the control panel of a diagnostic ultrasound machine which has been severely damaged by warm and humid conditions found there. This illustrates the fundamental mismatch between the context this device was designed for, and the actual context of use. High temperatures and humidity have a severe impact on technologies which were developed to work in temperate and controlled environments found in industrialized countries. In the tropics, temperatures can reach 27 degrees Celsius with humidity above 95%. The effect of such environments are numerous, such as accelerated aging, changing in parameters of electronic components, changing of material dimensions, overheating of transformers and electromechanical components and enclosures becoming distorted and failing. High humidity will cause corrosion and oxidation of metals, swelling of materials due to water sorption, electrical short-circuits and fogging of optical components. Heat and humidity combined is an ideal environment for fungus and microbial growth. Non-resistant materials are susceptible to direct attack as the fungus breaks the materials down and uses them as nutrients.

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Summary

0m 32s



Context: Harsh Environment



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Metabolic waste products excreted by fungus cause corrosion of metals, etching of glass, or staining or degrading of plastics and other materials. In arid areas, dust and sand are pervasive enemies of technology. Dust may obstruct openings, penetrate into cracks, crevices, bearings and joints. It will clog filters which leads to ventilation malfunction and overheating. Sand and dust are powerful agents of abrasion and will cause degradation of electrical circuits and interference and wear of moving parts. Solar light is a boon in tropical countries as it represents a wonderful source of clean energy. However, intense solar irradiation takes a severe toll on equipment exposed to it. Effects can be thermal, with the sunlight heating up surfaces in a directional way, which is different from just ambient heat. This may create destructive tensions in materials. In addition to the heating effects, certain degradations from solar energy may be attributable to other portions of the spectrum, particularly the ultraviolet. Deterioration of natural and synthetic elastomers and polymers will result. There are many other environmental problems such as the presence of rodents or insects which damage cables and enclosures.

Notes

Summary



1m 58s

Context: Harsh Environment



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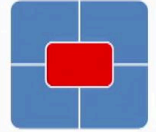
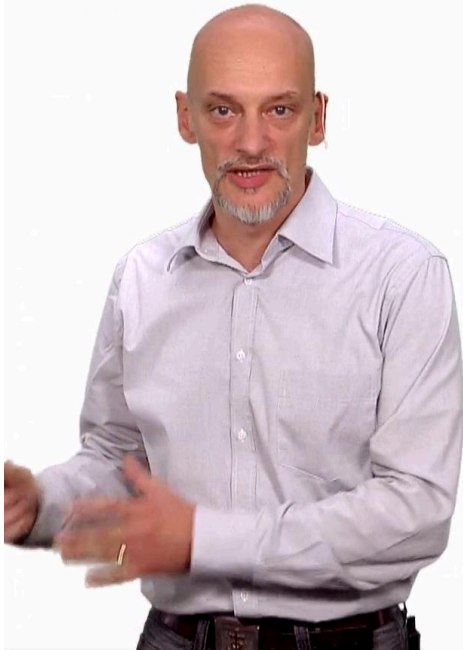
We should also mention the issue of theft. Sometimes, even low value and seemingly insignificant components will be stolen, which can make equipment useless with little possibility of repair. Finally, it is not only important to consider the environment where the technology is being used but also the storage and transport conditions. If you are interested in learning more about these environmental conditions and how the resilience of equipment is tested in these regards, we recommend having a look at military norms, known as MIL standards, which can be downloaded from the Internet.

Notes

Summary



3m 25s



Governance:

The process of decision-making and the process by which decisions are implemented.

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One of the most difficult and frustrating challenges is the one posed by the way we humans make decisions, and by the way these decisions are implemented. Broadly speaking, this is the definition of governance. The next challenge posed by the context that I would like to discuss is bad governance. The concept of governance can apply to public or private stakeholders. In the case of public institutions, we can mention international governance, national governance or local governance. For private institutions like companies, it is referred to as corporate governance. Bad governance affects many actors across the society, such as landlords, NGOs, cooperatives, unions, political parties, research institutes, corporations, media, etcetera. It involves a wide variety of inappropriate decision making processes, and/or inappropriate implementation of these decisions. Specifically, bad governance may encourage or facilitate corruption which is defined as "abuse of entrusted power for private gain".

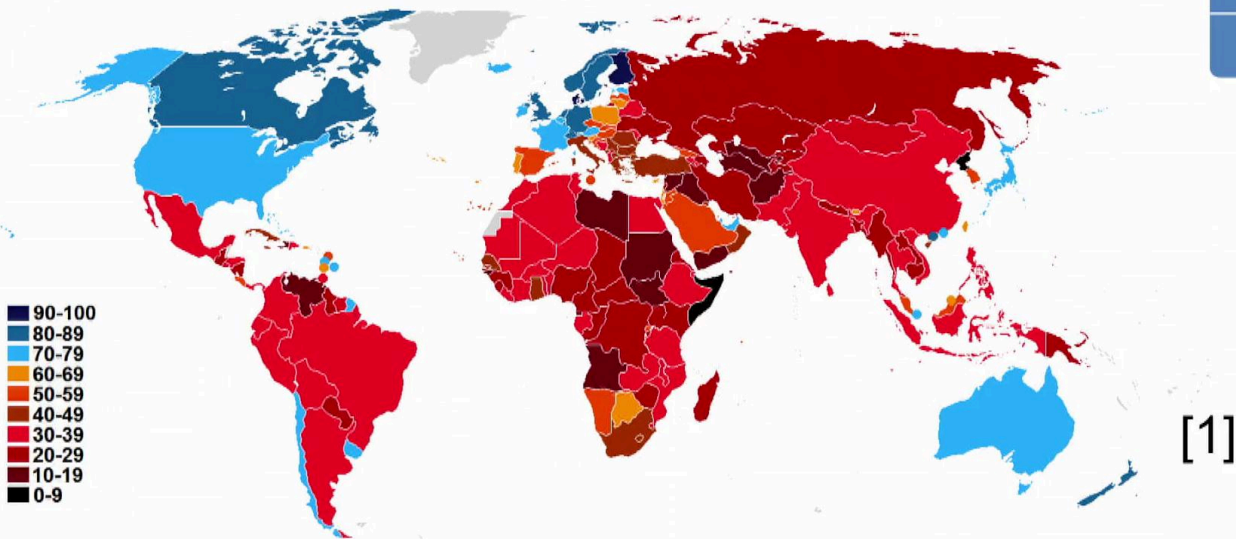
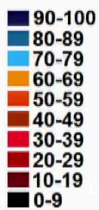
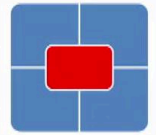
Notes

Summary



4m 05s

Corruption Perceptions Index 2015



[1]

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Other effects of poor governance are: excessive administrative hassle, also called "Red Tape", extortion, embezzlement, clientelism to cite just a few. It is only if we have a solid collaboration with local stakeholders in countries that we will be able to understand the subtle mechanisms at play in how decisions are made and implemented. They are heavily influenced by history, culture, religion and many other factors. We should, of course, remember that bad governance can be found everywhere on the planet, not only in low and middle income countries. Let's have a look at the specific case of corruption. This map shows the corruption perception index, which is defined as the level of corruption perceived by people living in the respective countries. The higher the score, the lower the perception of corruption. The index is based on opinion surveys and expert assessments from a dozen institutions such as the world bank, think tanks, foundations and research organizations. This is actually representative of how citizens of the countries perceive the situation and it is corroborated by independent assessments. As you can see, the problem is very widespread. In practice, this undermines society and prevents businesses and individuals from being successful.

Notes

Summary



5m 15s

Context: Ease of Doing Business



Starting a business
Dealing with Construction permits
Getting electricity
Registering property
Getting credit
Protecting minority investors
Paying Taxes
Trading across Borders
Enforcing contracts
Resolving insolvency



<http://www.doingbusiness.org>

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In some countries, it is so deeply rooted and pervasive that every contact with government or civil society will involve requests for bribes. Simply sending a product through customs without paying bribes is often a major effort which can take months. Here again, it is essential that we work together with local actors so that we can understand the problems. We strongly believe that with perseverance and a good understanding, it is possible to find ethically correct solutions but this remains a big challenge. There is one more metric which I would like to tell you about which is also closely related to governance. It is called the Ease of Doing Business index and it is very important for entrepreneurs. The index is composed of sub-indices, each measuring a specific dimension. It focuses in particular on measuring the effect of a country's laws, regulations and processes on the ease of creating and running a business. For example, it determines how many days it takes to go through the legal and administrative procedures to start a business. It measures how difficult it is to get the construction permits to build a warehouse, to get connected to the electrical grid, or how burdensome it is to register a real estate property right.

Notes

Summary



6m 42s

Context: Ease of Doing Business



Starting a business
Dealing with Construction permits
Getting electricity
Registering property
Getting credit
Protecting minority investors
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It evaluates how easy it is to get credit, how well minority investors are protected against lawsuits, how companies will be required to pay taxes and how easy it is to trade across borders. Finally, it also includes an indicator of how well contracts are enforced and how insolvency gets resolved in case of bankruptcy. This complex set of parameters is then aggregated and countries are ranked according to how well they perform. Rather than showing you yet another map, or some country rankings, we recommend that you go to the World Bank's website to have a more detailed look at how your country of interest is doing. I would like now to take a little side step and talk about donations.

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8m 02s



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This video was filmed in a small church adjacent to a rural district hospital in Cameroon. What you can see is that the hospital had no more space to store dysfunctional and obsolete donated medical equipment. Donations epitomize many of the challenges which we have just seen. At first sight, it seems that since low-income countries can't afford to buy new equipment, why would we not recycle used equipment from industrialized countries instead? Unfortunately, a very large majority of donated equipment either never becomes functional at all or breaks down shortly after having been delivered. According to the World Health Organization, less than 30% of donated medical equipment is ever commissioned. There are multiple reasons for these failures which can, in general, be attributed to a combination of the main contextual challenges which are the topic of this video. Of course, donations are critically important in humanitarian disasters and many other situations. Donating complex equipment such as medical devices can even be successful and sustainable if a serious process is followed which involves assessing the local situation and preparing the donation in close collaboration with the recipient organization.

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Summary



8m 50s



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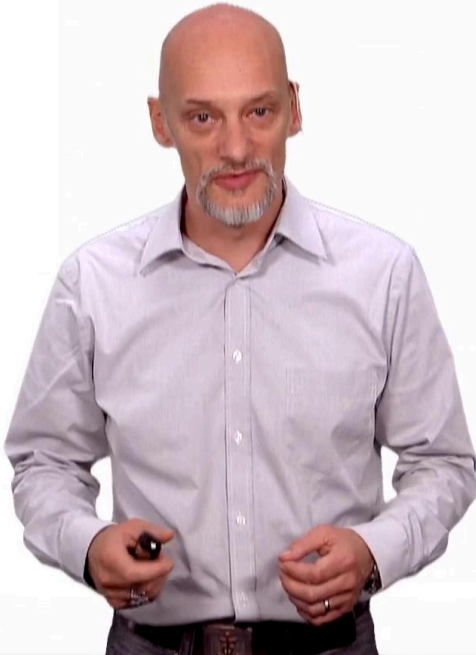
Let us listen to Mr. Andre Mama Fouda, Minister of Public Health of the Republic of Cameroon, as he discusses the case of medical equipment donations in his country. Indeed we receive donations coming from partners from different countries and the difficulty is often the age of the given product. It's often devices that have a certain age and which may not be in the market anymore. This poses the problem of spare parts regardless of the productivity of the device itself. Besides that, with those donated devices we also have the problem of consumables, which are not always available and could be lacking, causing the users to put aside the device. Of course some devices need calibration and on-site adjustments. Often we don't have a technician that already knows that kind of device. That's why I pay a lot of attention to donations, especially when the donation is an electronic device. As long as it's something mechanical we can find local solutions. But when there is a big electrical aspect, we need to be careful with those donations. Our discussion about contextual challenges would not be complete if we did not mention cultural aspects.

Notes

Summary



10m 11s



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On this picture, you can see a lady in Cameroon who was sent to the hospital by her traditional healer for a medical exam. The interaction between traditional practices and modern western medicine is sometimes uneasy. Such cultural and traditional aspects are very important and should be seriously considered from the start. Technology innovation will, by definition, cause some disruptions in the usual way things are being done. We need to be cognizant of the cultural influences and here again, there is no better way than a close collaboration. Of course, this does not mean that we should design solutions which are so specifically adapted to a community that they lose any interest for a wider public. We have to be able to step back and think about how to broaden the impact of our technology. Cultural differences offer wonderful and fun learning experiences, but have the potential to derail the best projects if they are not deeply understood. The description of the context of low and middle income countries we have just given may sound negative and difficult. The challenges are real but so are the upsides. We are convinced that success is possible and there are many examples where entrepreneurs have been able to succeed. Getting there is exciting, fun and instructive, and we strongly encourage you to not be afraid by the challenges. Good bye.

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11m 59s

