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## **GROUND RULES FOR THE 21<sup>ST</sup> CENTURY**

### **Chapter 9**

#### **OPEN UP TO ALL THAT THE WORLD CAN CONTRIBUTE**

Years ago, way back when I was a journalist, I wrote an article on LEGO's educational activities, and when it was published, I was called up by the chief press officer himself, who in a tense tone reminded me that LEGO was spelled in UPPERCASE letters and anything else would expose the trademark to risks of plagiarism and losses in the billions.

What a control freak, I thought, what makes him think that he can decide whether I should write in UPPERCASE? Somehow it diminishes one's perception of a company that behaves in that way.

As it happened, a few years later I was hired by LEGO as a futurist in the internal think tank VisionLab. At one point I was on a research trip to Japan, and in an ultra-hip designer shop in Kyoto, I found a sticker for sale with the word "LOVE", written so it looked strikingly like the LEGO logo.

I had the sticker lying on my desk at the office in Billund, and it didn't take long before my colleagues down in the legal department got wind of the presumptuous sticker and sprung into action. The shop in Kyoto was contacted and threatened with serious economic consequences. To me it seemed ironic that this was the system's response to some fans that had spent considerable resources on creating a sticker that expressed their love for the brand. It reminded me a bit of smashing a flower.

LEGO showed exactly the same knee jerk reaction towards un-authorized interaction with the brand, when the Internet began to make it possible for LEGO fans across the globe to meet online around their hobby. On the Web you can still find examples of the dialogue from back then. In the autumn of 2003 Chiao Cheng, an American Lego enthusiast, created a website where LEGO fans could upload pictures of their designs and comment on each other's models. The site was called [www.ratemylego.com](http://www.ratemylego.com). On December 16<sup>th</sup> 2003 Cheng received a letter from LEGO's lawyers. The letter began by stating that it was always nice to see that people are so committed to the company's products. But as we all know, LEGO and LEGO bricks are registered trademarks, and LEGO has to be extremely vigilant against any form of unauthorized dealings with the trademark, in order not to endanger their copyright ... and therefore they would politely, but unequivocally insist that the site was shut down. Otherwise there would be grave consequences.

Cheng's reaction was predictable. 14 days later he launched a new website, [www.legosucks.com](http://www.legosucks.com). The logo was written in stylized bricks, and the very name Lego was half burned and in flames (and yes, spelled in lower case!). On the front page Cheng explains why he had shifted 180 degrees from being a passionate fan of the brand to urging fans to boycott it:

"I would like to stress that for years I have been a big fan and supporter of Lego. Anyone who knows me will testify to my love of Lego, and how many times I have praised their quality and defended the high price you pay for them. So it is with great regret that I must now write this. "

And then Cheng proceeded to tell his story of how love turned from disappointment to sadness and now anger.

From LEGO's perspective, Cheng and other related fan sites constituted a clear threat: A violation of their sovereign control of a brand, which the company spends millions to defend. But you could also choose to see it from another angle: There are adult people who are so committed to the company's products that they spend significant amounts of their spare time creating websites where they can exchange models and experiences using bricks with other fans. It plays a significant part in their lives, but when LEGO one day addresses them personally, it is not a director who writes to say thanks for their dedication, but a lawyer who threatens them to stop playing. Apparently, headquarters is so busy protecting the brand that it is willing to wage war against those who love the brand the most.

#### The company does not decide what gets opened

In 1998, when Lego launched the robotic construction kit Mindstorms, the company experienced a demonstration of the creative potential among their fans. Just a few weeks after the first version of Mindstorms was launched, an American student had hacked the programmable RCX computer brick and published enough details about it that others could begin to write their own programs and create an alternative programming language.

It took a few months for LEGO to make up its mind, but the company chose to drop the resistance and to make it an explicit part of the software's license that users had the right to hack it. Back then it was a difficult decision for a notoriously closed and protective brand. But as it turned out, the openness was arguably a major reason that Mindstorms became the best selling single LEGO set ever.

Mindstorms has evolved to become the default tool when engineering students - or primary school students for that matter - need to learn about robots and programming of motion. LEGO itself has developed many courses for schools, but they are by far surpassed by all the amazing projects and hacks that are developed and exchanged in the many communities of Mindstorms enthusiasts.

By the time the successor to the RCX brick, Mindstorms NXT, was launched in 2006, LEGO had learned their lesson. The fans were involved from the start, and openness was deliberately designed into the system as a distinct quality of the product. From the early stage of development LEGO designers created an international advisory panel of Mindstorms fans who were known to be particularly inventive, and they became directly involved in the design.

LEGO has published all the software for the new generation Mindstorms as open source. The code is open to anyone and LEGO is specifically encouraging anyone to hack and improve the system. A small but telling detail: The old RCX bricks could only be connected to sensors, motors, etc. through special LEGO cables and with special connectors that looked like bricks. Therefore it was difficult to hook it up to any other equipment than original LEGO products. The NXT brick connects using standard telephone plugs, which enables users to experiment by connecting all sorts of other manufacturers' gear.

On the web there has been a corresponding change of culture. Today, LEGO has a department that specifically works to assist and support the various online communities - without imposing on them.

**The LEGO stories illustrate a fundamental change of attitude that many companies are going through:**

**Previously, a company would see its strength in having complete control over how its product were used and perceived, but now there's is a growing understanding of the enormous strength in listening to users and involving them in developing ones' products further.**

**We will see this change in most industries in the future: First, companies must learn to be open and accommodating - and they must unlearn the reflex-like secrecy, which has been the norm so far.**

**It's not a question of moral or of pleasing the users. It is matter of survival. As products become more complex and integrated, a company that insists on being closed to input and participation will simply not be able compete with companies that understand how to incorporate the competencies of others.**

### Open Innovation

The term Open Innovation is frequently used in order to describe a more outgoing attitude and strategy. Professor Henry Chesbrough from Haas Business School at Berkeley University was among the first to provide a systematic overview of the trend.

In his book, with the straightforward title *Open Innovation*, Chesbrough writes that change starts when a company recognizes that there is more knowledge outside the company than inside it. Even for large corporations with extensive development departments there will be more smart brains working elsewhere - and as the LEGO examples showed this expertise might very well be among the users.

**To gain access to outside ideas and expertise, a company must change the way it develops and manages knowledge.**

**Instead of trying to invent everything themselves, they should deliberately seek solutions from outside.**

**Conversely, by being more open to others a company may be lucky that someone from the outside can use some of its ideas and inventions that the company is not able or ready to use itself.**

Openness is hard when you are accustomed to doing everything yourself. As Jens Froslev Christensen, professor at Copenhagen Business School, notes, well-established business development departments tend to believe that relying on their own efforts and their in-house knowledge is a guarantee of the quality of their product.

Procter & Gamble has become the classic example of how even a corporation with a strong and assertive culture can renew its innovation by becoming more outgoing. Procter & Gamble - or *P&G* - is a vast conglomerate. Among its brands are Tide detergent, Pampers diapers, Duracell batteries, Gillette razors and much, much more. The company is doing very well. In 2008 P&G had a turnover of 83 billion dollars - after a growth of nearly 50 percent over the previous three years.

Back at the turn of the millennium, the company's situation was very different. Sales were stagnant, the stock price had halved, and the brand seemed tired and out of step with the times. In 2000, P&G had 7500 people working in product development, never the less it was clear that even though the group expanded its development departments, it would not be able to make enough of the kind of radical breakthroughs

that could create new sources of growth worth billions of dollars every year. Instead the incoming CEO A.G. Lafley decided to draw on innovation from outside. This was a major cultural shift. P&G is a company where leaders are largely recruited internally, and as in other large American corporations the excellent development laboratories were a source of great pride. The phrase 'not Invented here ' is said to come from P&G. Nevertheless Lafley made it a goal that half of the innovations in P&G's new products should come from outside.

The slogan for P&G's transformation was "From R&D to C&D: *from Research and Development to Connect and Develop*."

The message to designers and engineers in the development teams was that their task was now to find solutions, but not necessarily by solving the problem themselves. The developers' task was to make contacts, find ideas and engage in collaborations with the best people in the world - outside the company.

The strategy has been a clear success. P&G's profits have tripled since 2000; the cost of product development relative to turnover has decreased, while the hit rate of new products launched has increased. In addition, P&G has built a lucrative business selling access to the many ideas and knowledge from their laboratories that they cannot exploit themselves.

#### IBM's commitment to Linux and open source

IBM is another juggernaut, which very deliberately chose openness. Like P&G, *Big Blue* realized back in the 1990s that their old model of innovation was inadequate. For many years IBM's software development had lost ground to other giants like Microsoft, Sun and Oracle. Rather than trying to create a new competitor to Windows or the UNIX operating system, in 1998 IBM choose to go with the open source software Linux.

Linux is a kind of potluck party. Thousands of programmers contribute to developing the software, but the results do not belong to anyone, and it's free for anyone to attempt to change or improve the code. Linux has been particular successful on servers and in other professional back office contexts, but so far it's had limited share for desktops applications that are visible to the ordinary PC user.

As discussed in Chapter 8 the development of Linux is organized by a working group, led by the original developer, Linus Torvalds. This core group selects and assembles changes and additions that are submitted to them by a worldwide community of programmers.

Some of the programmers are fiddling with their ideas on their own, but far more are involved through user groups that coordinate projects.

Contrary to what one might think, a large part of the code is not written by amateurs but by programmers who are employed by companies that use Linux in their business and therefore are interested in having the software developed to meet their needs.

In 1998 IBM decided to invest heavily in Linux. IBM assigned around 300 programmers to develop the software, and IBM contributed money to support other activities around the Linux project. Initially, the company invested about a billion dollars in building up a business based on open source software, and since, IBM has held on to its strong commitment to Linux. With such a level of investment it is clear that IBM can really make a difference and put a clear mark on the development. However, IBM is not the only big company that puts substantial resources into Linux

development. Other "old" giants such as Novell, Cisco, Dell and Nokia are also among the developers.

It's worth taking a closer look at how working with Linux is different from the old-fashioned type of internal development.

By using Linux, IBM can draw on a huge network of programmers and a great diversity of talents, ideas and philosophies that they could not possibly have housed internally. In that sense IBM - like the other developers in the community – is only paying for part of all the development efforts they have access to.

The website Ohloh.net tracks the number of contributors to open source projects like Linux, Firefox, Apache and MySQL. At this writing, 5900 people are registered as contributors to the Linux Kernel, which is the central, "official" version of Linux. Ohloh estimates that the total effort contributed to the development so far is 2600 man-years.

#### You gain influence but loose control

Actually, IBM doesn't *have to* pay. Most Linux users simply use the software without contributing to the development. In principle IBM would be free to do the same. But by investing in Linux development IBM can influence and help assure that the program remains competitive and that it contains the features that IBM's customers need.

Compared to the programs that IBM develops internally, an obvious and radical difference to Linux is that IBM does not own the software they spend resources to develop in the Linux domain. They only have *access* to it, like everyone else. It is clear, though, that because of their intense work with the program, IBM builds a special expertise in using it and making it useful for their clients.

**The former head of development at British Telecom, Peter Cochrane, has described the shift to an open development strategy as going from hoarding and holding on to information in order to get power to instead sharing information to gain influence.**

IBM does not have the same level of control over the software as if they had developed the whole thing themselves. IBM's programmers can submit any number of suggestions, but they cannot decide whether the proposals are actually incorporated into the new versions of Linux. That decision depends on what the rest of the community thinks. Or put another way: Contributors have *influence* based on the quality and usability of their code.

IBM also has less control over development in the sense that others can add features and applications for Linux, which IBM never could have foreseen and which they perhaps have no particular interest in.

"Lack of control" sounds alarming, but in this case it is a asset - it's not in IBM's interest to dominate Linux. IBM is looking for something completely new, unexpected and unpredictable, and IBM would have difficulties creating this through a closed and controlled internal project.

Opening up is a more indirect and uncertain way to invest in development - but it's a strategy that fits well with the network economy's vibrant global communications. Interacting with outsiders challenges our usual tendency to try to control as much as possible ourselves. It's a dilemma we must learn to feel confident about: If you really

want other people to add something new, you have to be prepared for change and surprises. One must cede some sovereignty to enjoy the benefits of cooperation – just as all the others who are involved must do.

#### For complex services you can't deliver all the parts yourself

The classic industrial paradigm is the *vertical integration*, where one company controls large parts of the supply chain: Henry Ford's empire started with raw materials, rubber and steel production and stretched all the way to a global network of dealers and service shops. Rockefeller's Standard Oil controlled the extraction of oil, refineries, pipelines, tank cars and petrol stations.

That kind of top-down organization is well suited for optimizing mass production of relatively simple physical goods. In contrast, the goods and services we buy today are increasingly complex. They consist of a large number of sophisticated and diverse components, and they operate in close interaction with many other products and industries. Value is created through *horizontal integration* - across previously separate industries and disciplines.

**Future products and services are so complex and varied, and they will change so rapidly that it is no longer realistic for a single company trying to master all aspects of how the product is composed or delivered to users. Instead, companies must open up, form alliances, collaborate on development, production and marketing issues, and - not least - you must learn to engage users.**

As C.K. Prahalad wrote in *The New Age of Innovation*, outsourcing is not just about cost savings, but probably as much about securing access to resources and skills that you do not have. We must link up with the necessary resources where they exist - including end users. In short, it is about *integration, interaction and flexibility*.

Moreover, it's not only in business that each organization's competence is insufficient in relation to the type of challenges we will face in the future. The same applies to nation states. There are limits to what a country can accomplish on its own in an intensely connected global reality. Even the United States or China can't save the coral reefs or stabilize the climate alone, and without global cooperation, we are powerless against transnational problems such as cyber-crime, epidemics or runaway financial crises.

We are back to one of the first game rules in the book: You have to see yourself as part of a larger context – and you can't do that without opening up to interaction with others.

#### From "steady temperature" to "indoor comfort"

You can get a sense of how the rules change by looking at the Danfoss thermostat – an icon of Danish industrialization. In principle, it hasn't changed much since it was launched in 1946. It does one thing really well: It keeps a specific temperature - for example 21 degrees. It is a relatively simple piece of mechanics, and it really not that hard for other manufacturers to copy the design and to try to make it cheaper. This puts Danfoss in the same situation as many other companies with products that are no longer quite so innovative: It is threatened by *commoditization* where the only way to differentiate the product in the market is by having the lowest price.

That is not a very attractive game to play. Competition on price with companies from emerging markets is a formidable challenge for any Western company, and profit margins are shrinking year on year.

A countermeasure to commoditization is to try to move up the value chain by creating products or services that are based on more sophisticated knowledge - and therefore not so easily copied.

In the case of the thermostat one could imagine that Danfoss chose to offer a more comprehensive service. Instead of delivering 21-degree fixed temperature, it might offer to supply "indoor comfort."

This would require that Danfoss integrated a wide range of technologies and devices that can contribute to "indoor comfort". It is no longer just a matter of regulating the radiator temperature. The system should also handle cooling, the ventilation and filtration of air, the light, acoustics, colors of the walls, the materials used in the building, furniture, etc. Furthermore, there may be considerable variation in what people perceive as comfortable. "21 degrees" is a simple, objective parameter, and it is always the same. "Indoor comfort" is very different, depending on where on earth you are - or even what time of day it is and what the people in the room are doing.

**Compared to traditional mass production, you need to play a completely different game, if you choose to move from a simple, stand-alone product to delivering a more complex service.**

**First, you must integrate a much broader range of technology and expertise, and you must be able to customize the service on an ongoing basis to suit the individual's situation here and now.**

**This can hardly be done with a traditional, closed, we-can-do-it-all-ourselves - policy.**

#### Digitization makes products parts of a larger network

One way up the value chain is to digitize the product. Danfoss has developed a thermostat with wireless communication, so the thermostat can be programmed and controlled from a computer. Digitization makes it possible to program it to follow residents' changing needs more precisely, but more importantly, it makes the thermostat part of a much larger system. The same PC that controls the thermostats can also control lights, blinds, the burglar alarm or multimedia system, and in many cases entirely new services can emerge by coordinating the functions of the devices in the system.

When the thermostat or some other piece of gear is part of a larger context, it also means that the manufacturer has to adapt to a much wider group of stakeholders. With the old stand-alone Danfoss thermostat there is a limited number of parameters that Danfoss have to conform to. The thermostat needs to match the standard widths of pipes and a relatively few other requirements that are specific to the heating industry. In contrast, the functionality of a wirelessly connected thermostat depends on whether it's compatible with products from industries that previously were completely separate from the plumbing field. Danfoss now suddenly has to position itself in relation to standards and business models that are used by Microsoft, Mitsubishi and Apple.

#### Common destiny - for good and worse

One can consider whether there is any alternative to behaving more openly and collaborative in the future. A company that does not have a high degree of exchange

and coordination with other groups will find it very difficult to provide competitive products.

We're used to doing things ourselves and to be in control. The new paradigm is to understand that by letting go of some control one can obtain access to far greater resources and a broader range of knowledge needed to develop and deliver the type of products that are likely to succeed in the future.

It makes less sense for a company to perceive themselves as an independent actor. In reality, ones success is closely linked to the success of the other players who are involved in creating the outcome. This makes it in one's own interest to share knowledge, which can be useful for the others - and likewise, others are likely more willing to share their knowledge with you, because they understand that it is to their advantage that you are progressing.

Yet one should not be blind to the fact that there are risks associated with opening up to a wider and deeper cooperation. When one's products integrate with what other companies are doing, the quality of what you can offer depends on the quality of the other system elements. And similarly, your commercial success becomes much closer tied to whether your business partners have success or not.

Again, an example from LEGO can illustrate the effect: The plastic bricks were launched in 1949 and for the first three decades of LEGOs history sales grew steadily as the company expanded to new markets and the range of toys was developed. There was a certain predictability that allowed the company to think long term. One year they could launch a police station, the next year this could be expanded with a police boat, a helicopter and so forth. For the management, the challenge was to manage and stabilize growth and to optimize production facilities to develop the most efficient and error-free way of delivering a scheduled number of boxes with bricks.

But in the late nineties sales became far less predictable. LEGO had become a producer of much more than bricks. It had diversified to include clothing, school bags, educational materials and computer games. Furthermore, the themes of the play sets had become much more specific. From producing basic, generic toys with evergreens such as trains, cars and houses, LEGO was increasingly dependent on fads, and when the company began making boxes, and games based on Hollywood films such as "Star wars" Harry Potter and "Spider-Man". LEGO's sales became closely linked to the hits and misses of Hollywood.

A more comprehensive and more direct interaction with other stakeholders is a prerequisite for development of complex solutions and in order to maintain a company's market position. But it implies that companies increasingly are exposed to changes and influences that they themselves have no control over.

In the next chapter, we will explore the benefits and risks of letting go and share ones knowledge.