



Regent Accelerated Management Program (RAMP)

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THE GREATEST FORCES ARE INTANGIBLE



The impact of the great depression in 1929 brought the world to the borderline of understanding those forces which are intangible and unseen. Through the ages humans have depended on our physical senses, while having limited knowledge of the actual physical things around us that we could see, touch, weigh, and measure. We can draw a parallel to the great depression last century to that of the global pandemic in 2019.

We are now entering the most remarkable of ages where we can all learn something about the intangible forces of the world around us. For instance, we may learn that the ‘other self’ is more powerful than the physical self that we see when we look into a mirror.

Sometimes people speak casually of the intangibles--the things which they cannot perceive through any of their five senses - and when we hear them, it should remind us that we are all controlled by forces which are unseen and intangible.

Humankind does not have the power to cope with, nor to control, the intangible force wrapped up in the rolling waves of the oceans. Humans do not still not have the capacity to understand the intangible force of gravity, which keeps our planet earth suspended in the Universe, and keeps us from falling, much less the power to control

that force. Humans are entirely subservient to the intangible forces that hail from thunderstorms and is just as helpless in the presence of the intangible force of electricity—do we really know what electricity really is, where it comes from, or what its purpose is!

This is not the extent of human’s ignorance in the connection to things unseen and intangible. We do not understand the intangible force (and intelligence) wrapped up in the soil of the earth--the force which provides us with every morsel of food we eat, every article of clothing we wear, every dollar we carry in our pockets.

WEALTH CREATION



Whatever your action is to be, it is evident that you must act now. You cannot act in the past. It is essential to the clearness of your mental vision that you dismiss the past from your mind. You cannot act in the future because the future is not here yet. And, you cannot tell how you will want to act in any future contingency until that contingency has arrived.

Because you are not in the right business or the right environment now, do not think that you must postpone action until you get into the right business or environment. And, do not spend time in the present planning the best course in possible future emergencies. Have faith in your ability to meet any emergency when it arrives.

If you act in the present with your mind on the future, your present action will be with a divided mind and will not be effective. Put your whole mind into present action. Do not give your creative impulse to the original substance and then sit down and wait for results; if you do, you will never get them. Act now. There is never any time but now, and there never will be any time but now. If you are ever to begin to make ready for the reception of what you want, you must begin now.

Your action must be in your present business or employment and must be upon the persons and things in your present environment.

You cannot act where you are not. You cannot act where you have been, and you cannot act where you are going to be. You can act only where you are.

Do not dwell on whether yesterday's work was well or poorly done. Do today's work well.

Do not try to do tomorrow's work now. There will be plenty of time to do that when tomorrow comes.

Do not try by occult or mystical means to act on people or things that are out of your reach. Do not wait for a change of environment before you act. Cause a change of environment through action.

You can act upon your present environment so as to cause yourself to be transferred to a better environment.

Hold with faith and purpose the vision of yourself in the better environment, but act upon your present environment with all your heart and with all your strength and with all your mind.

Do not spend any time in daydreaming or castle building. Hold to the one vision of what you want, and act now.

Do not cast about seeking some new thing to do or some strange, unusual, or remarkable action to perform as a first step toward getting rich. For some time to come, your actions will probably be the same as those you have been performing. But, now you will perform those actions in the certain way which will surely make you rich.

If you are engaged in some business and feel that it is not the right one for you, do not wait until you get into the right business before you begin to act. Do not feel discouraged or sit down and lament because you are in the wrong place. No person was ever so misplaced that he could not find the right place, and no person was ever so involved in the wrong business that he could not get into the right business.

Hold the vision of yourself in the right business — with the purpose to get into it and the faith that you will get into it. But, act in your present business. Use your present business as the means of getting a better one, and use your present environment as the means of getting into a better one.

Your vision of the right business, if held with faith and purpose, will cause the Supreme Power to move the right business toward you. And, your action — if performed in the certain way — will cause you to move toward the business.



DISRUPTION IN HIGHER EDUCATION BY DR CLAYTON CHRISTENSEN

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- Higher education has historically been poor at finding out what students want and what they need. What we will have in the future will be a wide array of choices for the students: When do I learn? Where do I learn? What do I learn? How do I learn? These non-consumers will become consumers of higher education.
- When you look across the sweep of human history, almost in every instance a company that at one point was widely regarded as unassailably successful slips to the middle of the pack or often the bottom after a decade or two. What is it that causes successful companies to fail? It is rarely that somebody beats them by coming into the market with a better product, but rather that somebody comes in at the bottom of the market, with a product that's not as good as the leaders are making, but is a lot simpler, a lot more affordable, so that a much larger population of customers can now own it and use it.
- What's happening for the first time in over a century is that online learning is a disruptive technology allowing this kind of entry into the market at the bottom of the higher education market. For the first time in academic life, we have been able to articulate why so many universities are going to run into trouble in the future if they continue to do things the way they've always done them.

Why successful companies fail

The puzzle Dr Clay Christensen worked on throughout his academic life was to look at what causes successful companies to fail. He explained this process of disruption through the disruption of the steel industry.

There have historically been two ways to produce steel: the first is with integrated mills, which cost about \$10bn to build new. The simplest product produced by those mills was concrete reinforcing bars, which were not very profitable to make, while at the top of the scale was sheet steel that was used to make appliances and cars. That was very sophisticated to make and so the margins were much more attractive.

In the last 1960s, a different way to make steel emerged, called mini mills. These melted scrap in electric furnaces, and you could put about 10 of these electric furnaces in a room. The most important dimension of a mini mill was that you could make steel of any given quality in a mini mill for 20% lower cost than you could make it in an integrated mill.

Imagine that you were a CEO of a steel company somewhere in the world. In a really good year, your profit as a percent of sales would be 4% or 5%. Here's this new technology that would allow you to reduce your cost of making steel by 20%, so don't you think you'd adopt this new technology?

But not a single integrated steel company anywhere in the world built and operated a mini mill. Here, Clay explains why something that makes consummate sense is actually impossible for smart people to do.

These mini mills became viable in the late 1960s. Because they were melting scrap in these molten furnaces, the quality they could make was pretty crummy. In fact, the only market that would buy what the mini mills made was the re-bar market way down at the bottom, because there are almost no specs for rebars anyway and once it was buried in cement you could never verify it. So it was a perfect market for crummy products. As the mini mills hit the rebar market, the reaction of the integrated mills was that they were happy to get out of the rebar market; it was such a dog-eat-dog commodity.

They could only make 7% gross margins on those products and that counted for only 4% of the industry's tonnes. It never made sense to defend the rebar business because if they focused their assets higher up the scale, in angle iron and bars and rods, they could make 12% margins. So as the mini mills expanded their capacity to make rebar, the integrated mills shut the lines down or reconfigured them to make the more profitable products.

Then an interesting thing happened. The integrated mills chopped off the lowest profit part of their product line, and added up the remaining numbers to see their profitability improve as they got out of rebar. The mini mills, because they had a 20% cost advantage, rolled tons of money as they got into rebar. The symmetry worked quite well until 1979. That was the year when the mini mills finally succeeded in driving the last high cost integrated mill out of the rebar market.



If you look at what happened to the price of rebar in 1979, it collapsed by 20%. There's just a subtle fact about strategy that nobody thought about before: a low cost strategy only works when you have a high cost competitor in your market. As soon as they had fled upmarket, it was just low cost mini mill fighting against low cost mini mill in a commodity business and very quickly prices dropped down to the point where none of the mini mills could make money.

So what are those poor suckers going to do? Well for a while they tried to get more efficient making rebar, but that's just a recipe for survival. One of them looked upmarket and realised if they could figure out how to make bigger and better steel they would make boatloads of money. So they attacked that next tier of the market above – which was angle, bars and rods – and as they did so the reaction of the integrated mills was that they were happy to get out of that business. It was such a dog-eat-dog commodity.

Why would they ever defend the least profitable part of the business when we could focus our investments in structural steel where the margins were so much more attractive?

So the very same thing happened, and the integrated mills chopped off the lowest profit part of their product line and added up their remaining numbers so their profitability improved as they got out of angle iron, bar and rod. The mini mills, because they had a 20% cost advantage, saw their profitability rebound too. Again there was peace in the industry.

That lasted until 1984, the year when the mini mills finally succeeded in driving the last high cost integrated mill out of the angle, bar and rod market. The price of those products collapsed in 1984. The reward to the mini mills for their victory was they couldn't make money. So then they hit the low end of the structural steel market, and again the reaction of the integrated mills was that they were happy to get out of that business because it was dog-eat-dog... and so the story repeats.

The very same thing happened. Again, peace was restored until 1996. That was the year when the mini mills finally drove Bethlehem Steel, the biggest of the integrated mills, out of the structural steel business. Prices collapsed. So the mini mills had to go upmarket, and so they attacked that next tier of the market and focused on the specialty steel where the margins were so much better.

Today, the mini mills have about 65% of the whole market and all but one of the integrated mills has gone bankrupt. There was no stupidity involved on either side of the equation. At every stage of the process, as the integrated steel mills got out and got out and got out, their profitability improved. And as the mini mills went up and up and up, their profitability improved.

The reason why it's such a difficult phenomenon to deal with is it's the pursuit of profit that causes one to go up and the



other to go up in chase. Just imagine if you were a little boy trying to kill a giant. How would you do it? Would you come up right ahead of them on their trajectory to try to make better products that you could sell for better profits to their best customers? They'd kill you. But if you come at the bottom of the market, you define a situation where the giant is motivated to flee rather than fight you.

That's the mechanism by which successful companies find it so hard to sustain their success; it's because the pursuit of profit by smart people makes it easy to go up and almost impossible to go down.

Where else in the world's economy have we seen this happen? Cars is one market. Toyota came into the bottom of the market in the 1960s, not with Lexus, but Corona. Then they went up and up and up until they got to the Lexus. GM and Ford were up on the integrated steel companies' line, making big cars for big people. Occasionally they would look down at Toyota and think they should get them. But they would compare the profitability of the sub-compact with the profitability of an SUV or a pick-up, and it just made no sense to defend the least profitable part of the business when they had the privilege of making bigger products for bigger people.

Now essentially the game is over for Detroit. Who's killing Toyota? Toyota does not feel as if they're being killed, but the Koreans have taken the low end away from Toyota, not because Toyota's asleep at the switch, but why would they ever invest to defend the least profitable part of the business when they have the privilege of competing against Mercedes in luxury cars. Next comes Cherry from China, and so it goes on.

We could spend the whole day talking about how this has happened in industry after industry.

The disruption of Harvard Business School

Clay told a story about a student he had that had returned to Japan a number of years ago, taken a position in the Institute of International Trade and Industry, and been tasked with formulating a plan for the resurrection of Japan's economy. Through the 1960s, 70s and 80s, Japan's economy was just a juggernaut, growing at unprecedented rates, so anybody that got in their way got killed.

Then in about 1990, Japan's economy just died, and it's been in a stagnant swamp for 20 years. So the student worked on this for a couple of years and then he called Clay one day and said there's no hope for Japan. Clay was certain they could find a solution, so he called the student back to Harvard.

He came back to Harvard and after about an hour he'd convinced Clay that there was indeed no hope for Japan! What he pointed out was that the engine of Japan's macroeconomic miracle was disruption, company by company. It wasn't just Toyota in Detroit, but Honda did it first in motorcycles, then Sony killed RCA and Zenith with transistor radios. Canon did it to Xerox, Mitsui did it to the shipbuilding industry, SEKKO did it in watches, and by 1990 they had gone from the bottom to the top and they were making the best products in their categories in the world.

The problem with the top is that the percentages are attractive but there aren't any banks that elect deposits denominated in percentages, and the market up there is actually really quite small. As Japan disrupted America, America's main manufacturing companies shrunk and shrunk and consolidated, but as they laid people off, a few of them picked up venture capital and created new companies in new industries. So America's economy kept going even though the dominant manufacturing companies got killed by the Japanese attackers.

But Japan didn't have venture capital or labour market mobility, so they did it once and the game was over. The student pointed out that underneath Japan came Korea, Taiwan, Singapore and Hong Kong, and as they came perilously close to the top, China and India would come along at the bottom disrupting once again.

So there are signs that the causes of macroeconomic prosperity or stagnation depend on our ability to continue to disrupt the world.

There was a study in 1982 that pointed out that although Japan had about a third of the population of America, there were four times as many people studying maths, science and engineering in Japan than in the US. They fingered that as a critical reason why America couldn't keep pace with Japan, because we just couldn't generate the kind of technology and innovators who could be at the forefront of technology.

Clay knew almost all of the founders of Silicon Valley and he knew their children. The founders, almost to the man or woman, were extraordinary masters of engineering, maths or technology. The majority of them, incidentally, weren't Americans, but came from India, China and Israel primarily. Almost none of their children studied maths, science or engineering. Why is that?

Well the founders came from homes categorised by poverty, and studying maths, science or engineering was a ticket to the middle class. But once their prosperity was assured, why would their children ever want to study science, maths or engineering? They study things like Asian mythology, Greek philosophy or whatever, because there are so many interesting things to talk about.

So when you look at what's happened to Japan's college students, the number that are there studying those topics has fallen off a cliff. Because in Japan, prosperity has largely been assured, so why bother to go with all of the grief associated with topics like those when there are more interesting things to study. So the focus of technological leadership has shifted for a while to Taiwan and Korea, and now because of their prosperity they can't fill their courses in those topics and the genus has evolved to China and India, where because of their poverty there is still motivation to do things that otherwise a reasonable person would not choose to do.

The causality there is that we just aren't able to teach those topics in a cogent way, and that's really important as we move on to discussing the reasons why online learning will become so important.

And so to online learning. The way Clay Christensen taught at Harvard Business School was that for every class the students have to study some dimension of our theories about innovation, and part of their assignment is to come to class and point out to Clay what's wrong with his theory: it's only if you find what your theory cannot explain that you can improve this theory.

So this arrogant student raised her hand one day and said she had something Clay's theory couldn't explain. She pointed out that Holiday Inn came in at the bottom of the hotel market in the 1950s and 1960s, and for reasons that you can understand, the more expensive hotels didn't come down market but Holiday Inn couldn't move up either, they were pinned at the bottom of



the market. She pointed out that McDonald's was the same; they came in at the bottom of the market and the higher priced restaurants didn't come down but McDonald's hasn't moved up. So it doesn't work.

It took Clay five years to work out a response to that insight, which is that in mini mills, as well as in cars and computers, there is a technological core inside that is extendable upmarket. So the same electrical furnace that worked in rebar by extension could work in the more sophisticated products. That almost always is the case. The problem with hotels is that nothing about its core is extendable, so if Holiday Inn wanted to go up to a higher price point they couldn't do it unless they replicated the position of the people up there; they'd have to hire a concierge just as Four Seasons has a concierge. They couldn't disrupt them by bringing to the market something that was lower cost but extendable.

That was very helpful to Clay as he began to think through the future of higher education, because historically has been true with higher education as well. If a two-year school wants to become a four-year school, or wants to add masters or doctorate degrees to go up the ladder, there hasn't been anything technological that was extendable for those at the bottom to extend to the top. For every step in the ladder, they had to replicate the business model of those they were trying to emulate.

But online learning brings to higher education this technological core that could be taken to the bottom end of the market and then was extendable upwards. In the history of higher education, there has not been any disruption of any substance. But online learning changes the game quite remarkably, Clay argued.

You can describe the history of almost any industry as a set of concentric circles where, in the middle, are people that have the most money and skill, and as you go out you encounter populations of people that don't have as much money or as much skill. Almost always, industries in their sophisticated initial appearance start in the middle and as disruption makes them affordable and accessible, a larger population has access so they move out.

With this context, Clay described another important disruption in history, and that is the disruption of the vacuum tube by the transistor. Through the 1970s, most consumer electronics were made with this technology called vacuum tubes, which were the size of a child's fist. In a television they had about 20 of these, so televisions of that age were huge in size and cost about \$2,000 in today's money, which meant that only people

with large homes and large bank accounts could have one.

The transistor wasn't initially disruptive relative to the vacuum tube because it couldn't handle the power required for those large TV sets. Every company that made the vacuum tube products took a license to the transistor and took the technology into their own labs before framing it as a technological deficiency. In other words, the transistor wasn't good enough to be used in the market yet. As a group, the vacuum tube companies spent about \$3bn trying to make that technology good enough to be used in the market.

While they were working on the problem, others tried to make transistors useful for something more affordable and accessible, competing against non-consumption – meaning going after customers that had never been able to have those big TVs. The first thing was a hearing aid in 1951, which you couldn't make with vacuum tubes. Then, in 1955, Sony introduced the world's first pocket radio, and those were crummy. But they were so much better than nothing for those that didn't have TVs, even if those with TVs would not have bought it because it truly was crummy.



Then in 1959, Sony introduced the world's first portable TV. Again, a very limited product, but because it was so much more affordable and accessible, they brought a television to a much larger population of people who historically didn't have enough money or a big enough apartment to have a TV. Because it was infinitely better than nothing, they were delighted to have it.

So you really had two markets here: the people in the back for whom this was not good enough and so the incumbents felt no pain, and then a completely new market emerging with completely new competitors competing against non-consumption.

By the late 1960s, electronics got good enough that you could make good products with them, and within the next five years they sucked all the customers in and every vacuum tube company was vapourised. It's not that they didn't see the technology, or that they didn't aggressively try to develop it, but the only way the transistor could have been useful to them was if it was better and more cost effective than the vacuum tube in their application.

During the 1950s and 1960s, that was a very onerous effort that had to be overcome. But by coming out and competing against non-consumption, all that Sony had to do was make a product that was better than nothing. The customers were delighted with it, and step by step it got better, pulled the customers out, and those incumbent guys got killed. Again, this has happened in industry after industry.

A couple of things about this that are salient to universities. First, in this new disruptive plain of competition the metric of performance changed. The reason why those that already owned TVs would have judged the Sony transistor radio as crummy was because by their metric, which is the quality of the sound, it couldn't compete. But for those that didn't have a big TV, the metric was different,

because this was portable and they could listen to rock'n'roll outside of the earshot of others and take it places.

Then, as it got better and better on those metrics, it also got good enough on the metrics for others, so that when it was comparable, customers were pulled out and incumbents were left with nothing.

The second important dimension is that customers are tempted into the new system, rather than the technology going into the old products.

Let's talk about the metric of performance changing. In higher education, there are performance factors by which universities become accredited, such as what percentage of the faculty have PhDs from good schools, and how much do they publish, and where. What percentage of students are graduating, and so on. In online learning, the other metric of performance is teaching.

Clay told the story of when he was visited by the Dean of the Business School at the University of Phoenix. Harvard initially wanted to turn that discussion off, because that university's performance is not very good on the performance factors by which universities are accredited. But let's focus on what the change in the basis of competition might entail.

The Dean from Phoenix visited Clay because he had attended some of his presentations and he wanted to record Clay's 10 best classes and make them available to their students online. Clay thought a lot about the lower end of the market, so he thought this would be fine. He went to the Dean at Harvard, and he was incredulous that we would prostitute the name of Clay Christensen and Harvard for these guys at Phoenix, but he said we don't really compete with those guys so if you want to do it, great. It's your life, go ahead.

So Clay agreed to do it, and they went downtown and engaged the auditorium at the Museum of Contemporary Art, with a beautiful view over the Boston landscape. And the audience was made up not of students but of models. They wanted to be able to show puzzled looks on the faces of beautiful students so viewers could feel that empathy, alongside others who just looks relaxed.

Clay did his stuff, and three weeks later he watched the class. It was amazing how clear and engaging it was, he said! They had gone through and cut out all of the mis-words, and instead of crummy PowerPoint, this was animated, 3D stuff. Clay had no idea how good he could be!

Phoenix were going to show it to all 135,000 of their full-time MBAs. Harvard brings in 900 every year, by comparison. Phoenix was focused on the concept of scale, and they were spending nearly \$200m every year making their teaching better. The amount of money spent at Harvard on making teaching better at the time was possibly somewhere near zero, Clay said.

So in that metric, what to Harvard is good, to Phoenix is irrelevant. But teaching is where they were going to give Harvard a run for its money.

The second thing is that a lot of times we think that this stuff coming out in the new plain isn't going to make a difference because in the current plain it's protected by regulation. In our study of history, never does the strength of the incumbent yield to head-on attack by the disruption. Rather, they work around those regulations and the network effects in this new plain of competition, and the old one just collapses.

So, for example, back in the history of computing, IBM made the mainframe businesses and their customers and suppliers of software all designed their work to work on the IBM mainframe system. IBM had a 75% market share, they made about 98% of the industry's profit, and it was about as close to a monopoly as the US Justice Department had ever seen, and it bugged



them. So they sued to break up IBM. The US government spent about \$1bn trying to break IBM apart and IBM spent over \$1bn defending itself.

As they were working on that problem, elsewhere in this new plain of competition was a new thing called personal computers, and they were getting better and better. One day the government lawyers went to work, opened their briefcases, and realised no one was buying mainframe computers any more. The monopoly had been dissipated not by government regulation but rather by disruption. Almost always, when there are people that have their hands on something they don't want to give up, it gets broken by somebody that doesn't see those standards as relevant.

In the original set of metrics, we try to give accreditation to the university itself. Now, it's not clear that that's what we need to accredit. Just as an example The Washington Post, through a subsidiary, set up its own law school. It didn't meet the standard to let any of their graduates stand for the Bar in any of the 50 states, but people kept signing up to take classes in this online course. When you went in, virtually, and asked them why they were doing it if they couldn't stand for the Bar, the answer was that these students didn't want to be lawyers, they just needed to understand the law.

They might not do any more than a few courses, but they were measured by the knowledge they took away, or the courses they took.

We need to think about how accreditation is going to stand up against non-consumption.

Almost always, the people in the core have an instinct to deploy the new market in their existing business, and in order for it to take root as a pure play it has to compete against non-consumption. In electric cars, will electric cars disrupt traditional cars? The only way is if they come out and compete against non-consumption. It was not immediately a very good product and so the question initially was whether there was a customer out there that would love a product that wouldn't go very far or very fast. The parents of teenagers would love that! Then the car starts to get better and better and the parents start to ask the kids if they can borrow the car to go to work.

If you want to use the new technology in the core, to create an electric car that is fully competitive with the existing place, it's going to cost a lot of money. A few will have access to it, but almost always it's done with a hybrid. In order for an electric car to work on the California freeway, it needs a hybrid that takes the best of the old and the best of the new. That will be the way the world works for many years, while the pure electric car gets better and better step by step.

The same thing happens in online learning in a really important way. There are a few online schools that are taking root and competing against non-consumption, meaning their students are people who just couldn't go to a regular university because they are working or have kids or whatever. But for the rest of us in the hybrid, there are really interesting opportunities for that to be useful.

A new piece of thinking in innovation has been quite relevant, and that is the difference in the architecture of products

between interdependent and modular products.

In teaching, and this is true in primary and secondary school as well as in higher education, the architecture of the way we teach is interdependent in character. So there are temporal interdependencies. We can't teach this in 200-level economics if we haven't covered this in 100-level economics. There are lateral interdependencies... we could teach Spanish so much better but we have to change the way we teach English phonics. And there are physical interdependencies, around the architecture of the building.

These interdependencies make customisation very difficult, so it mandates standardisation in the way we teach and the way we test. If, for example, in software you wanted to have your own version of Windows it would cost you about \$1.2bn, because it's architecture is excruciatingly interdependent; if you change 10 lines of code you've got to change 10 million lines of code.

On the other side of this is another case where modularity makes a difference, and we know for example that every student is different: there are multiple types of intelligence, styles of learning, there are different paces at which we learn, there are different home and family backgrounds. Those differences really demand customisation.



As these two forces meet, the people that aren't served are the students, because of our inability to customise the way we teach, most students in most classes sit together not learning or learning very inefficiently.

There are a couple of good reasons why delivering content online makes a difference. The first one is, while an individual teacher can't customise the way he teaches to meet the needs of all the different ways the students out there learn, if you deliver online, it's actually quite readily customisable.

Coming back to the earlier point about why is it that when we become prosperous we would rather die than study science, engineering and math, and that is because we teach it in a crummy way. Nobody ever dictated that maths is an independent field from chemistry, but somebody decided they were different fields, so we study them independently. In fact, if you want to study engineering, they won't give you the privilege of running into engineering problems until you have guided your way through two years of maths. Then they will teach you engineering, because they think these are two independent fields.

As we go through college, we teach all of these fields as if they are separate. Then when students leave, they never use maths independently. You always use maths in conjunction with material science or finance, so almost everything learned in college is a field but in practice we don't use it as a field after we graduate.

If we deliver content online, the people who design that can actually teach maths in the context of biology. Teaching people to be innovators in that way is a huge improvement in the way we need to teach our people, and it can be done in a way that's engaging, because we labour under the weight of prosperity in terms of the motivation of our students. We need to solve that problem.

In the history of computing, for the first

two decades of the computer industry's life, it was dominated by virtually integrated companies, and they had to be integrated from the equipment that made the materials and components all the way to the sales. If IBM didn't do all of it, they couldn't sell anything, because there were no sources of their components, and to do anything they had to do everything. Comparably, their competitors had to do everything in order to do anything.

It's the same thing in cars – Henry Ford had to make his own steel because nobody was making it at a quality that he needed.

But in every industry, as the technology comes to be better and better understood, it becomes modular and when it's modular you don't have to do everything. The industry becomes horizontally stratified by specialists that just have to do one thing very well.

Right now higher education is at the start of this. If you go back a couple of hundred years at Harvard, they had taught the Bible for hundreds of years but they needed new content. When they looked, nobody was creating new knowledge that they could teach, so they had to integrate back into the generation of content. Being vertically integrated was really critical to success of the enterprise, and the more successful you were in integration, the more successful you were in what you could teach and how you would teach it.

Now the world is very different and we don't have to be integrated back into the creation of knowledge, because we are just awash in knowledge and the question is how do we teach it. And yet most universities that have been at the top of the ladder, still hold to this idea that we need to be integrated back, we have to do the research in order to be teachers, and we have to be teachers in order to do research. That just isn't true. Most of what they are researching doesn't show up in the undergraduate curriculum at all.

Another important dimension of modularity as it comes to higher education is that innovations scale or are adopted very slowly. The reason is that if IBM comes up with a new component, and there are about 10,000 components in a mainframe computer, and this component makes the whole computer work better. They decide they better take it to Control Data because it will make their computer work better too, so they knock on their door, show what it does to IBM, and what do the people at Control Data do? They can't just plug it in and have their product do anything, because they have an independent architecture. So for them to adopt this new component, they have to reconfigure their entire computer system.

So when you have an interdependent architecture, innovations diffuse very slowly because everybody has to look at it and work out how to fit it into their systems.

This is a reason why innovations don't scale well in primary and secondary school, because every district has a proprietary architecture in its curriculum. We can see, for example, that some types of schools do very well, but it doesn't scale, and the reason is because innovation that works for them is really hard to deploy in another system.

When an industry evolves into a modular system, the way the pieces fit together is standardised and so innovation in any component gets adopted very quickly, because you can see exactly how it fits in and what impact it will make.

It is likely that online learning will take root and innovations that really make a difference in the lives of students will scale very quickly.

A case study from Clay's MBA class is about a company called Michigan Manufacturing Corporation. This is a company that has nine plants in the Midwest making axels and gearboxes for cars and trucks. The case is focused in Pontiac, Michigan, where the auditors have come to say costs need to come down otherwise the plant needs to shut. The overhead divided by direct cost in this Pontiac plant was \$6.2. They pointed out there was another plant in the system where that ratio of overhead to direct was \$2.2.

It turned out that when the auditor went into the factory, the machines were all lumped together and the machines defined the departments. The reasons for this were threefold.



One is that the machines were very costly, so if you put them all together you could use them optimally. Two, the operators were very skilled and very costly too, so by putting them in the same departments you could utilise the labour most efficiently.

But the great thing about this organisation was that they could make any product for anybody. Any customer could come in with the design of a new axel, give it to the manufacturing engineer, he would look at it and he'd say that for this particular design we need to go to this part of the factory first with these machines, then this part, and then this. Another customer will come with a different product and that would take a very different path through the system.

The beauty was that they could do anything for anybody. So over time, in order to get more customers to come in, they kept advertising that they could do anything for anybody, so every customer was taking a different product and each one had a unique pathway through the system.

The other plant, with the much lower overhead, didn't look like this at all. Instead, they took the two pathways through the Pontiac plant over which most traffic flowed, and they put those routes in a straight production line in the plant. Their proposition to customers was that they wouldn't do anything for anybody, but if a customer could design an axel that could be made using the sequence, then they could deliver a very high quality product at very low cost.

The two plants had very different propositions they were giving to the market. Clay studied this and realised that every time you doubled the number of pathways that a product could use to make its way through the factory, the overhead cost increased by 30%. The complexity associated with having all of those interdependent pathways took a lot of overhead cost.

If this was not an axel factory but a university, you would see the very same



thing and the very same proposition that most universities are offering to students. That is, whatever you want to study, bring it here. You can study anything you want, and if they don't offer a major, they will allow you to create one. As a result, overhead costs in universities are increasing at a much faster rate than the cost of the faculty and the cost of the research. They are designed to give anything to anybody.

In fact it gets a lot worse, because inside a university – as inside a hospital – there are three completely incompatible business models existing. And there are only three types of business model in the whole world, actually. One of them we call solution shops, and a solution shop business is a business that defines the problem and figures out the solution. Consulting firms are like this – you give these guys a ton of money and they will tell you what's wrong and how to solve it. University research is organised in that way, as are the activities of diagnosing things in a hospital. Those businesses make money on a fee-for-service model, in one way or another.

The second type of business we call a process business, and that is one where you bring stuff in that's not complete, or is broken, and you do stuff to it and ship it out the other side. Manufacturing is like that, but so is much teaching.

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Every fall Harvard brings in 900 very partial people, who have all kinds of problems, and every day they do stuff to them, and after two years they ship them perfected to Wall Street. Other than in education, process businesses have a profit formula that is a fee for outcome.

The third type we call facilitated networks, such as telecoms – I send data to you, you send data to me, and the facilitator makes the money. Guilds in higher education are facilitated network businesses, and those typically make money on a fee for membership basis.

These are fundamentally different enterprises, and if you got suckered in to taking a job as the president of the university, it's as if you're presiding over McKinsey merged with a manufacturing business that then acquired a life insurance business. It's all together and you have to report your financial situation on the same financial statements, and when people ask you how well you're doing you have to measure with a single metric.

In the absence of philanthropy, no university would ever survive on its own because in fact that kind of combination is simply impossible to persist.

The same thing happens in hospitals. There's a hospital north of Toronto that is a process business fixing hernias. That's all they do, and they are really good at it. The cost of doing it, whether there or elsewhere, is roughly the same, but the overhead difference is significantly higher in mass general hospitals that are organised like the Pontiac plant. The total cost is very different, not because of the direct cost but because of the overhead associated with the proposition of doing anything for anybody.

What would happen if universities did not try to pull together the teaching and the research and instead said they were two different businesses.

The students come, most of them as undergraduates, to go through the system in a processed way. If that were organised in that way, the overhead cost associated with it would be a fraction of what we experience today.

Some want to continue to be engaged in the solution shop business, or research, but that actually needs to be a separate discussion, because the interdependence that was originally required for Harvard to get into research isn't binding today. We need to think of that as an independent effort, and that's just a crazy thought, because the way we think

is so conditioned by where we came from. Modularity now enables us to think independently that this is a business and that is a business.

Clay said the Harvard Business School itself was in the midst of a really powerful disruption, and what's happened to Harvard is their students are now so costly to hire that last year you had to spend about \$160,000 to hire a Harvard MBA. If you look at who hires Harvard graduates, there are very few operating companies that can pay the cost of a Harvard MBA.

They are hired by McKinsey, private equity firms, hedge funds, that can still pay these very high prices. But the operating companies, like Johnson & Johnson, Intel, General Electric, have all set up in-house corporate universities and there are now eight times more people learning management on the job than are engaged in MBA schools. That's a huge opportunity for Harvard, because these are all people that couldn't get into Harvard and yet they need to learn the best that can be offered.

If Harvard would then prostitute the name of Harvard, and let somebody else deliver them the content, management is going to be learned independent of Harvard. Harvard's ability to be the thought leaders is going to be destroyed, because those guys have scale. So the question is whether Harvard could use its technology and essentially commoditise the professor.

Harvard would make so much more money in that world than in the present and would impact so many more people. But it requires approaching education in a very different way, to commoditise the teachers and enable a much larger population of people access to Harvard's material.

Clay saw this not as a threat but as an opportunity.

THE 9 BASIC ACTION MOTIVES – BY NAPOLEON HILL

Reproduced and updated by Regent for teaching purposes



Napoleon Hill, in his book *How To Sell Your Way Through Life*, identified nine basic motives that drive people to take action. He argued that, save for those who do not fully control their own minds and are thus not fully responsible for their actions, these nine motives give us a great capacity to understand other people.

If we want to move someone to take a specific action, we must first plant a sufficient motive in their mind. We can start by understanding that all human beings are fundamentally the same, and thus, there are some common methodologies that can be used to influence people.

The following nine motives were identified by Hill as the things that inspire human beings to act:

1. The emotion of love, which is one of the most powerful moving forces in the world and can energise people to act fast. People may go to great lengths for love, and even the most rational person might do irrational things.
2. The emotion of attraction or sexual urge, which can cause many individuals to act fast in order to satisfy it.
3. The desire for material or financial gain, which applies very easily to a job or a business opportunity in particular.

Money is a very obvious motivator, but financial gain should also be considered in a broader sense, as well as all the implications that come with it.

4. The desire for self-preservation, because as a rule every human being tends to act in their own best interest to protect themselves. Having or wanting a job in order to take care of loved ones is an example of self-preservation.
5. The desire for freedom of body and mind, which is a particularly potent motive for those living under dictatorship and are unable to speak their minds. Naturally, human beings like to live in freedom and use their minds to think freely.
6. The desire for self-expression, referring to the building and creation in thought and material. Writers and artists often wish to create something that defines them as a person.
7. The emotion of anger or revenge, which is spring-loaded with negative energy and can move an individual to destroy or harm others or property. However, this energy can also be redirected to flow in a positive direction, to prove others wrong or to triumph over adversity.

8. The emotion of fear, which can again be negatively or positively directed. A student may be motivated to pass an exam by a fear of failure, for example, and other fears of things such as poverty, criticism, ill health, loss of love, old age, or death can be great motivators.

By understanding the driving forces behind the actions of others, common conflicts and frictions can be eliminated and more favourable relations can be achieved with friends and others.

Knowing another person's motives can tempt an individual to resort to manipulation, which Napoleon Hill does not sanction. He argues that no transaction should be sanctioned unless it benefits all of those involved.

