Technology forecasting for strategic decision making - An Introduction
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Technology Lifecycle - Seasons, Clockspeed – Part 4

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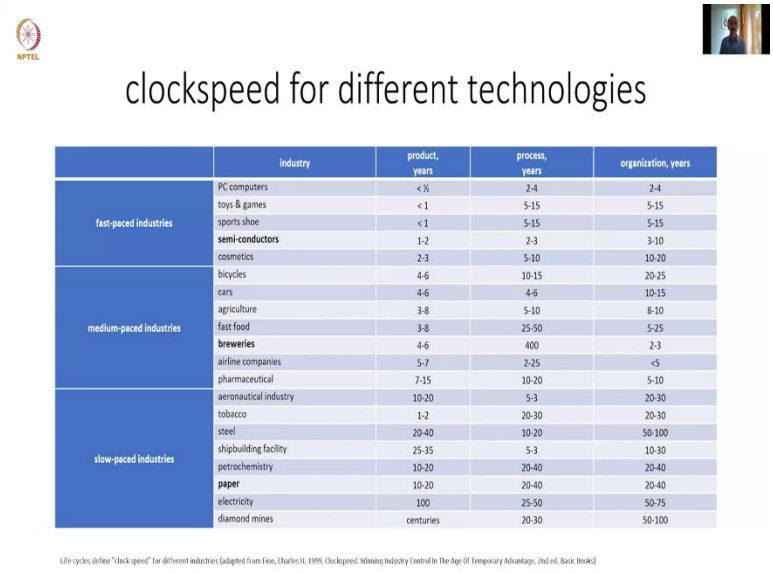

Professor Bala Ramadurai: So, thanks Dmitry for this, this is very very enlightening because we assume that, oh industries are completely, cannot be classified at all. This shed some light on what you can look at. So, one of the related questions I had, think partially I got the answer from your explanation of the music industry.

If I am a company and I look through this list and I do not find it, what do I do? How do I find out what will be my typical product evolution cycle, time and what is the process evolution cycle time and what is the organization evolution time? How will I get a fair estimate of the three, if there is not there in, my company is not in this list?

Professor Dmitry Kucharavy: Yes, usually, this is exactly the point how we will define the scope of our system, and we already discussed that the scope of the system we defined, first of all though it's function. And we already discussed that the function, the function represents what do we process. We process an input to the output.

And how can we find, how I can find our industry among this limited list? For instance, the semi-conductor industry, what they process? They process the data and information, okay? And if our system, process, data and information probably, our system will be in this part of industries like personal computers.

But if, for instance, we are talking about system, which process, the food, different kind of food or different kind of vegetables, this will be close to the industry like agriculture and beverage. So, on the level of the system, or the level of definition of the function, what do we process? Okay, what do we process - will help us to identify in which industry we are.

For instance, airline companies, what do they process? They transport passengers. If you are talking about, for instance, a railroad industry, if you are talking about any kind of transportation which process passengers, which move them from one area to another one, whatever we are talking about, they have high probability to appear in this group of industries. This is a general guideline; how do we use this list.

For instance, if you are going to predict the future of currency, one group of students with whom I worked, they tried to predict the future of bitcoins, for instance. So, we, what do they process? They process something like, what is processed by diamond mines. That means which concentrate. Is it okay for answering your question?

Professor Bala Ramadurai: Yes, this definitely gave me a direction to think when choosing which ones to choose from. I have another question is, now, given this information about the three buckets, so if I work for a company, and I am one of the decision makers, how do I use this information? So, now that I know this is my product evolution time, this is my process, this is my organization, how do I use it in my own company? That is one question. I have a second one after this.

Professor Dmitry Kucharavy: Yes, the decision maker is not going to use this information. This information is useful for people for building forecast, because the decision maker, they usually are going to use the result of forecast, the forecasting. Those models that I introduced about lifecycle, technology and season and lifecycle and clock speed; they are useful to produce forecast. They are useful within forecasting process.

So, the decision maker is going to use the result of forecast. Of course, it is a good idea if the decision maker will have, okay, some ideas how this forecast was developed, what are the seasons, what are the different seasons and why the forecast suggests those or that result in this time. So, but those are the models which are useful for reliable forecast.

Professor Bala Ramadurai: Okay, thank you so much. That actually helped me clarify saying, these are two sets of people, decision makers and forecasters. This is most useful for, if you are a forecaster. But it will help as a decision maker, I totally agree with you. One follow-up question on this and I really, I mean we have had so many discussions on this but I still want to bring this up, is that particularly cars, I saw a notice that the organization cycle time is 10 to 15 years.

Does that mean they have to start re-thinking, re-inventing themselves or... see because car companies, we know many of those big companies have lasted for a lot longer than that? Does this information mean that they are re-inventing themselves once every 10-15 as an organization? Is that how I would interpret that?

Professor Dmitry Kucharavy: Yes. Thank you for this question because we, here we need to understand that each kind of technology which replace previous one, and assume that we define technology as a synergy of hardware, knowledge and skills plus orgware organization. We, in fact, we cannot introduce new technology without change in organization. But the state of change on the organization is slower.

And inside of the car companies, which exist for instance for hundred years, the changes on the organizational level, they are essential in order to support the new model of product. It is not only the new skills how to produce and how to use it, but it is also the new organizational changes. And if you look, for instance, inside of the companies, inside of the companies which exist more than 10 and 15 years, okay, they re-organize themself inside by unit with this, with this speed.

So, this way, we cannot separate, for instance, introduction of new kind of recording technologies, without changes of the process and without changes of the organization which is behind. If you like organization, this is a business context. This is a 'how do you run the business', 'how do you run the management of human resources' and usually, it has to be well-coordinated and well-connected.

But sometimes, it is faster to change the process, okay. Sorry, but sometimes, it is not so easy to change the process. Like with brewery, because the process is very traditional. When, at the company level, sometimes, we have companies which pop up much faster than the new process or organization are changing. Organization, this is a structure which support the development, production, delivery, use and recycling of our technology. Is it okay for clarifying the question?

Professor Bala Ramadurai: Yes, yes this is very clear. In fact, it led me to another question - is particularly the one that you pointed out which is, I am looking at fast food and agriculture. And I am thinking, wow fast food evolution will depend on agricultural evolution also. So, how do we rationalize this kind of interdependencies?

And I am fresh off this video about interdependencies in forming a system. And here, we are looking at two systems which have interdependency. How do you... say if I am in the fast-food industry, how do I rationalize this with developments that are going in agriculture? Because it affects me.

Professor Dmitry Kucharavy: Yes, what is interesting in this table, this is a result of empirical study. And what is interesting also, that if you look carefully, like your question about agriculture and fast food, we can see that this inter-relation, they are not linear. It means, the speed of changes in the process in agriculture does not produce the same speed of changes in a fast food.

Okay, and in agriculture, in fact, there are changes of the process which appear regularly and now, we start to be aware about these changes, assume that the concern about used pesticide and used, you know, technologies, how do they pollute environment, how do they make impact to the quality of water and so. We start to aware that we have a huge change in agriculture.

When the fast-food industry, this is industry which process another thing, because in agriculture, we process the energy in order to get some fruits, some vegetables, some results. When, in the fast food, we take those and we process it in order to have something which are consumable by human being on the level of society, on the level of society.

So, you look to the result of this empirical search and you can see that it is not linear, it is not linear and this is, for me this is a very very interesting to look on these numbers like you asked about. Thank you.

Professor Bala Ramadurai: Okay, thank you. This chart is extremely interesting. Thank you so much. I am sure our learners will have a lot more questions also about this particular chart because it has, is loaded with quite...

Professor Dmitry Kucharavy: Yes, we need not to complicate too much to find the reasoning because, you know, the complexity of interaction in system, if you just increase it, we will arrive, we will arrive, with a complexity situation that it is not predictable. But for the prediction, we use an equilibrium between empirical study, between something that we measure and we try to simulate using logistic curve. Even we do not know all the reasoning we have to be capable to predict. But in which time horizon this is the main idea of this table to share with you.