Customer Relationship Management
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Lecture – 20
Economics of CRM (Contd.)

Hello everybody. Welcome to Customer Relationship Management course in Swayam NPTEL platform this is Dr. Swagato Chatterjee from VGSOM IIT Kharagpur, who is taking this course for you. We are in Week-3 and we are discussing about Customer Lifetime Value.

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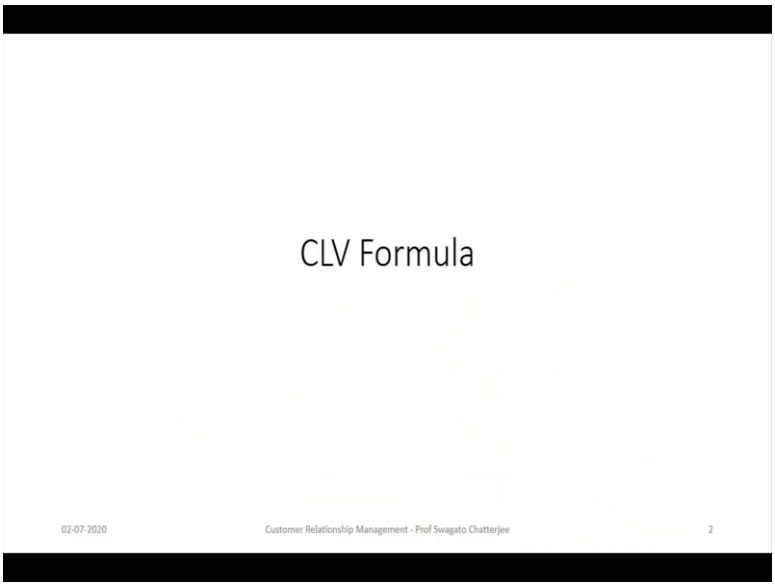

And in this particular video, in the last video also and in this particular video we will be discussing about the math's part of customer lifetime value. And how that can be used in various kinds of decision makings? So, if you remember in the last in this particular class we have discussed about the CLV formula basic CLV formula.

I have done the math's part, how to calculate CLV, how that formula came ─ the derivation of the formula basically. And then how that can be used in two simple problems are whether you should give a discount or not a simple basic problem.

Now, what happens is, you have to think here there that there are two things that effects the CLV, one is that retention rate which is r and another is the discount rate which is i.

Now often times customers or the managers thinks that customers will not stay for lifetime. We are doing the calculation for infinite time period. Customers will not stay for lifetime and they will stay for a let's say 5 year, 6 year, 10 years time.

So, should we do this calculation for infinite time period or should we do ─ be practical and do it for next 5 years. Now 5 year is a very important point often times because this is not too long not too short, 5 years is a timeframe often time you will see that when you go to a interview the interview person in the front ask you that, where do you want to see yourself in 5 years? So, that is a question basically that they are asking that.

Be realistic don't be too much dreamy that what I will become something xyz in 10 years and don't be very short very myopic that, I will just join this job in 1 year be realistic and at the same time not myopic. And that is why you tell me that up to 5 years you can probably be able to visualize yourself. So, visualize and tell me where what will what do you want to be in 5 years same thing applies here that I will do this calculation not being very dreamy about.

What happens in this 10, 20 years 5 years is a realistic assumption. And now when 5 years is a realistic assumption the question comes is that I want to make maximum amount of money in this 5 years. Now here if you see in this particular table that I am showing here.

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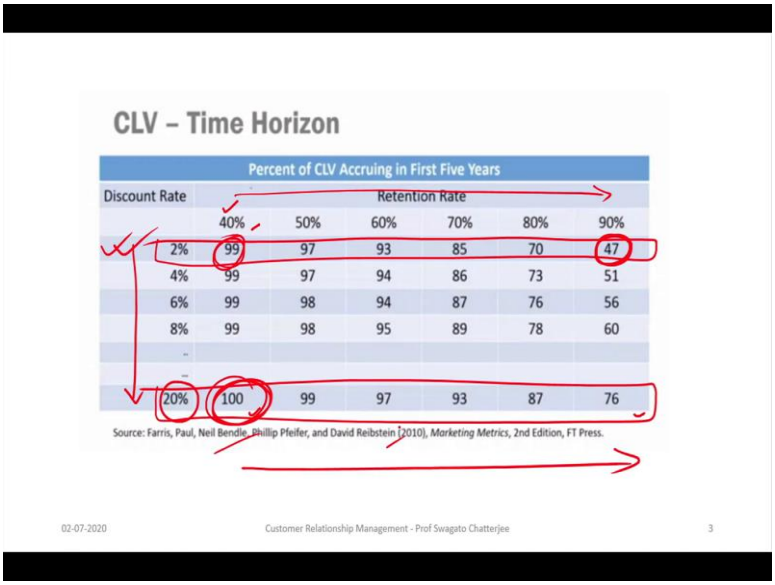

There are discount rates and there are retention rates. Now discount rates are basically the 2 %, 4 %, 6 %, 8 % these are basically your how much is the interest rate that this particular market has, while retention rate is given. Now, you cannot handle the discount rate, you have no control on the discount rate, but you have pretty good control on the retention rate.

You can do various things, various kinds of marketing strategies you can take up, to ensure that your retention rate goes up. Now if discount rate is, if I come down discount rate is like this and here this is basically a very I would say volatile market. So, when the discount rate is high ─ the interest rate is high then anything can happen. It is it is very fluctuating very volatile.

And in that kind of a market even a small retention rate can make maximum amount of money in the 5 years because you do not expect much of the money at the later point of time. Whatever happens now, whatever money get generated, gets generated now because later nobody stays with you or-or even if they don't stay with you that does not matter because of most of all the money generate now, at this moment. The money that you generate later point of time they might have ah, I would say, if the volatility is very high then you want to make money as quickly as possible. So, this is something that we can see that you will see that even with a very…..When the retention it is 40% and if I increase from discount rate to 2% to 20%; so, 99 is the case in this particular situation. On the other hand, if the retention rate is ─ if your market is very stable: so, this is a volatile market and this is a, stable market. In a volatile market even with 40% retention rate you make lots of money.

When the retention rate is 90% most of the people stays back, you make less amount of money in 5 years. So, in a volatile market if the retention rate is high anywhere (Refer Time: 05:10) with in general the retention rate is high this drops. Basically from this side to this side the 5 year interest rate drops, but in a volatile market within a 5 year, even with a smaller retention rate you can make lots of money. Now I will focus on this 47% if the retention rate is high.

And the market is stable, 2% is the discount rate market is stable market is not moving much. So, whatever money you make today tomorrow and today they have similar value to you then you want to make your customers stay. You want to get the money slowly

over time. So, at that time the retention rate higher is basically better because you make more money through retention rate. If the retention rate is smaller the most amount of money you make in the 1st year itself later point of time you don't make money.

So, in this kind of a situation you might want to focus on: when your discount rate is high - low you want, might want to focus on your retention rate much higher much, much more importance you will give on the retention rate. But when it is discount rate is high, you might say that I will not give so much importance on the retention rate.

Because you see 40% retention rate you get 100% , 60% retention rate event if you increase the retention rate by 20% still most of the money is getting generated by 1st years, 1 st 5 years only. So, I don't think that you have to focus on the retention rate much when the volatility is very high. So, this is a basic time horizon kind of a discussion that you have to keep in mind when you discuss about customer lifetime value.

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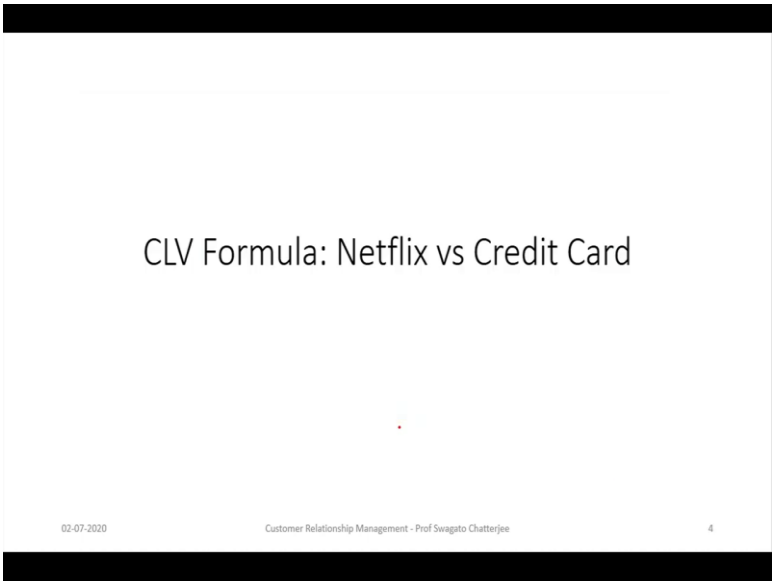

Now, I have given a simple formula for Netflix. I have given you some problems. The formula for Netflix and it is formula for credit cards. Credit cards also, you, the more you use credit card the more value you generate for the customer right. So, the credit cards will also calculate the customer life time value and based on that they will say that.

You have a preapproved offerr of let's say a credit card with 1, 00,000 or 50,000 or 2, 00,000 of this thing depending on how much is your credit-worthiness. And they will say that you have a preapproved card why don't you sir come and pay the membership fee or whatever and then get the card for you. So, these kinds these kind of offers discounts blah blah blah are also there.

So, you will get ─ you get that kind of calls from banks. Now they are also focusing on your ─ they give multiple offers in the 1 st year, why will you, why will they give multiple offers in the 1st year? You will make lots of loss in the 1st year if they give multiple offers, because they are not making money in the 1st year.

They are making money over your usage as you go on using for multiple times they get a little bit of I would say commission from where? Whenever you use the credit card that is number 1 and by chance if you forget to pay you pay back then they will make money from that. So, your un-credit worthy behavior and your multiple purchases this is the two basic streams of pay and also tie ups and etcetera.

So, these are the streams of revenue. That revenue does not get generated in one transaction over a lifetime it gets us profitable. Now; that means, that they also have to calculate customer lifetime value. But the calculation will be different for them and for Netflix and that is what I am going to show you now.

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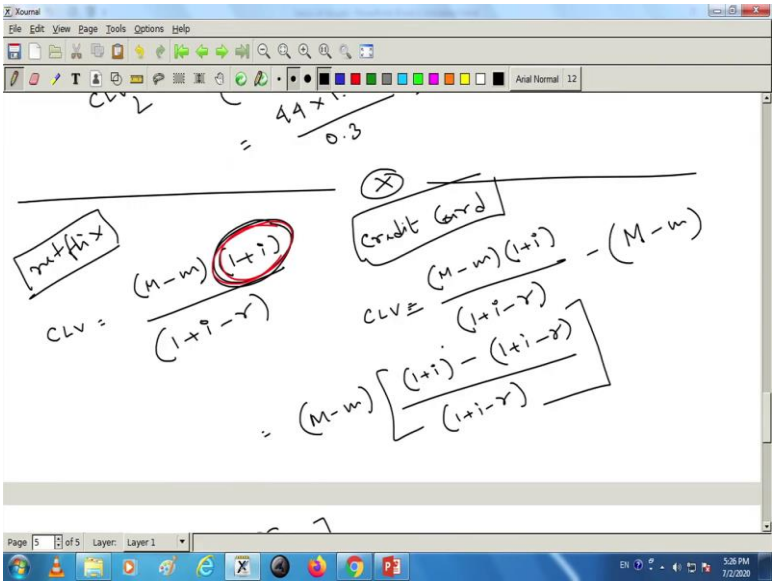

So, if you remember in the previous one I told that customer lifetime value is M minus m 1 plus i divided by 1 plus i minus r. This is the basic formula. Now, what happens in case of credit cards, how credit cards make money? So, credit card in the 1st year they don't make any margin.

They make, start making margin from the 2nd year the 1st year basically they do all the… So, it is a credit card right. So, you pay later. You purchase initially and you pay later. So, basically you, we are focus and it is a monthly, in this condition it is a monthly purchase. So, if you make monthly purchases in the, at the end of the month you pay for the last months purchases.

So, if I do this calculation for the monthly perspective, then customer lifetime value calculation will be, that M minus m 1 plus i by 1 plus i minus r minus M, because for 1 month, for exactly 1 month the Customer Lifetime Value will be generated later. The margin will be generated later. For the 1st month you will make a loss and then you will start gaining. For on the 1st month you will do lots of marketing expenditure which will be a loss and the 2nd month onward you will….

Or I will make a purchase 1st and then I will pay you back. So, in the 1st month you pay for my purchase. So, that margin or whatever we are denoting that margin will be not there in the 1st month. That is the simple difference between a Netflix. This is Netflix and this is basically a credit card company, any credit card company their calculation is like this. And if that is the case you can check, what is the formula then? So, M minus m just 1 minute. I think this will be the formula.

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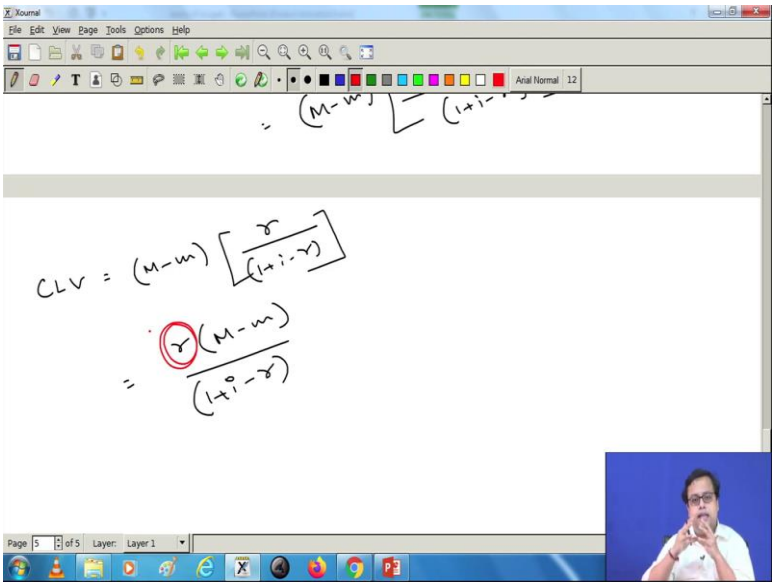

So, M minus m by i plus i minus 1 plus i minus r divided by 1 plus i minus r; yes and that gives me ─ that gives me CLV is equal to if I just check this formula this is M minus m, just check this formula r by 1 plus i minus r. So, this is what I get as the net formula r into M minus m divided by 1 plus i minus r.

So, instead of instead of 1 plus i here which is the general case I am getting r, that is the difference between these two cases. So, it applies to which kind of cases? In any come, any condition where you make the purchase 1st and you make the payments later ─ 1 month later, you make the payments of the last month in this month is something what you will do. It applies for other cases also for example, room rentals. Room rentals you do all the services first and you pay later.

So, anywhere in any cases where the payment is later and the services the, so let's say, let's say, you have gone to a serviced apartment and sometimes you pay in the serviced apartment at the end of the month in the 1st full month they give you service. And then in the end of the month you are paying. if that kind of a condition is there then the 2nd formula will apply, not the 1st formula will apply. So, if you have to pre pay or then or then and there whenever you are consuming you have to pay then the 1st formula will apply.But if the consumption and the payment happens after a after a time period there is a time gap, then the 2nd formula will apply because the marketing cost will be initially

given. And in the 2nd time period onwards the money that will be getting generated in the year 0 there will be no money getting generated.

So, that is a basic difference between the Netflix's case and a credit card company's case.

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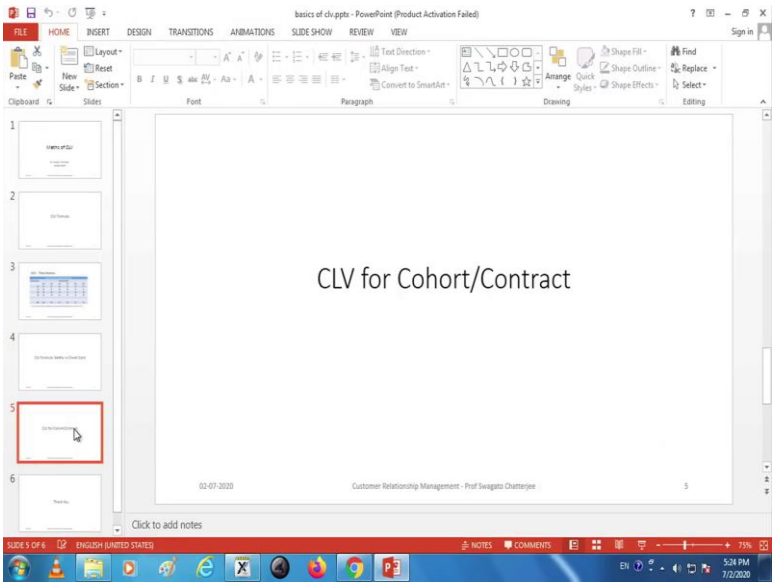

Now CLV for Cohort or Contract: now if you have to, if you check carefully that we have assumed one single thing.

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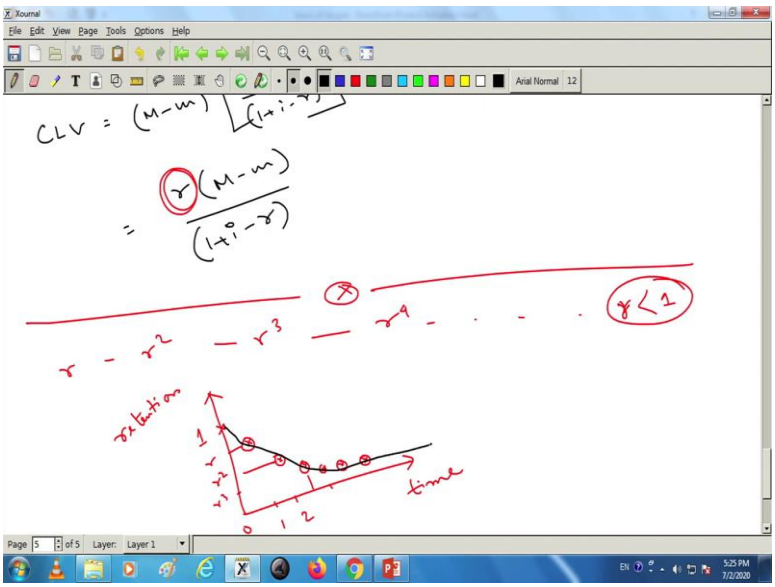

We have assumed that the retention rate is r. What is the retention rate r means Retention rate r means that in the 1st year r number of customer stays back in the 2nd year r squared, 3 rd year r^3 and so on 4th year r^4 and so on.

So, if I just try to plot that, okay this is time and this is retention how many customers stayed back in the 1st year 1? Because everybody stayed back in year 0, in year 1 this many customers stayed back. In year 2 this is r let's say year 2 r squared customers stayed back in year 3 r^3 customer stayed back and so on.

And r cube, r^4 will be slowly coming down because you know that these are r is smaller than 1. So, r^2 and r^3will be slowly coming down. Now if I plot it if I plot it will look like a curve like this. So, this is a basically a retention curve.

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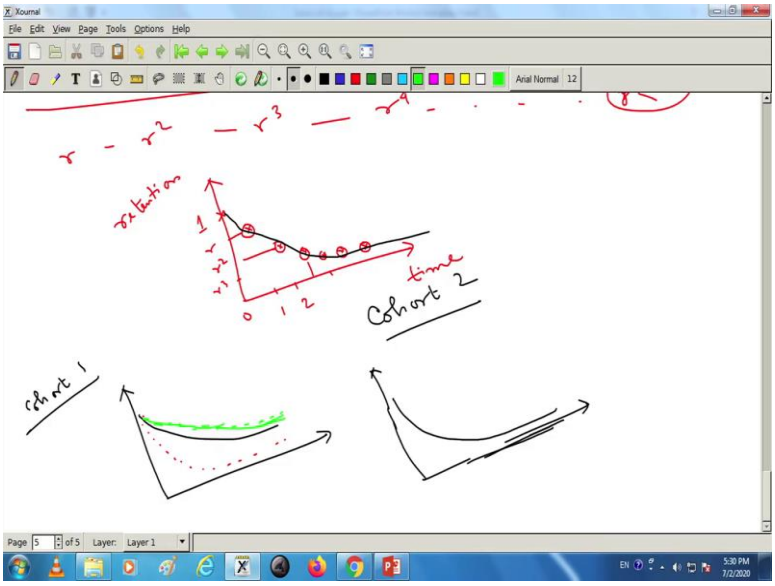

And I can create 2 cohorts, cohort 1 and cohort 2 based on this retention curve. So, I should not calculate. So, cohort 1 is like this: and let's say, cohort 2 is like this, which comes down very fast, whose retention rate is very low and it comes down very fast. And I should deal these 2 groups of customers differently.

What I am trying to say this? What I am trying to say this is that, let's say, when we do customer lifetime value, customer lifetime value if you carefully check this formula it depends on i, is fixed for everybody. Nobody can handle i, but it depends on capital M

minus small m and it depends on small r retention rate and the margin the net profit that you generate.

Now, you are saying a customer is highly profitable. A customer can be highly profitable for two reasons: one is that he spends a lot of money; that means this numerator the capital M minus small m is very high or he stays for a longer period of time. Thus r is very high; the retention rate is very high. Now if you just say that okay these are my profitable customers or these are my not profitable customers and within the profitable customers you do not break them further.

Then the high retention person and high immediate expenditure person you will treat themsimilarly. Let me give an example, let's say, I am a ─ me and my father okay. My father is very loyal to a particular mobile company I on the other hand is always looking for that particular mobile company which makes, which gives me good value. On the other hand I am a huge spender. I watch movies, I do I play online games, I do this, I do that I download lots of stuff.

So, I use the technical facilities given by this technology company which is a telecom company quite a lot and my father just watches a few YouTube videos. Probably some TV serials here and there, makes call uses WhatsApp and that is all. So, probably very basic things, and I am an avid user. So, even if I stay for 3 months, I will expend, I will do lots of expenditure for that 3 months, but I will not stay.

Because the moment the new technology comes, new offer comes new something comes, I switch back. On the other end my father is a long time stayer but he has fixed revenue. He does not create, make, give lots of money to this telecom company in a small period of time. Now when we calculate the CLV for both of them I will be profitable customer because of my capital M minus small m, that means the net money that I am generating over each month.

And my father will not be profitable for that my father would be profitable for my r ─ for the retention rate. Now if you, me and my father, if you treat them similarly when you are dealing when creating an offer and dealing with them then you are making a mistake. So, within the profitable customers you have to check for retention rate based cohort and retention rate based cohort is basically looks like this that in one case the curve will be very sharp in other case the curve will be...

So, let's this is the average the average: so, if I draw this carefully let's say, this is, this black line is the average line and this is one customer group and this is another customer group. So, we do this using survival analysis that how what is the probability that customer will stay and not always you see, not always I have drawn that average retention rate.

I have drawn this curve like this, but not always, this will be r r square and so on the retention rate can also be a function of time sometimes the retention rate of r t here we have say that the retention rate…

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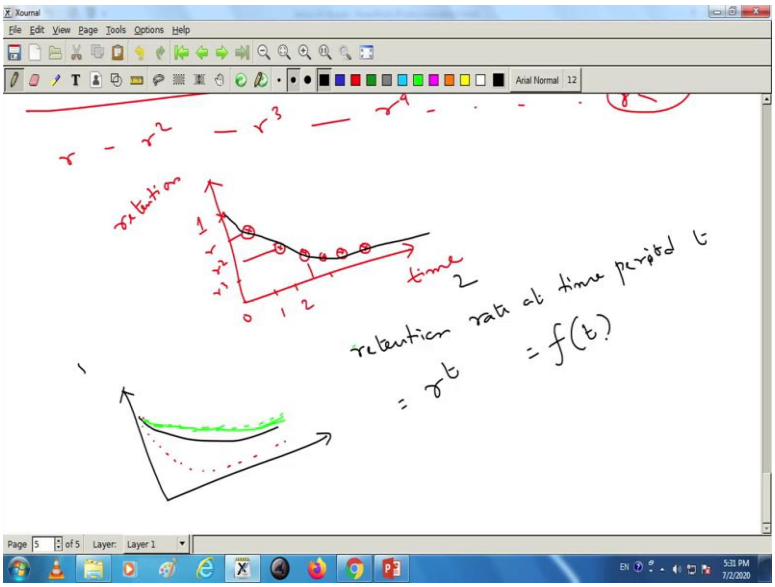

The retention rate at time period t period, t we have taken as r to the power t (r^t). That is the formula that we have taken, but that is an assumption, it might be some other function of t, some other functions it is a decreasing function of t.

But it might not be exactly a I would say, logarithm function kind of the not logarithm, means r to the power t that kind of function it might not be that. It might be something else now that functional formula can also be different. And if these things are different basically, if these things are different then the retention pattern creates cohorts.

And you have to focus on this cohorts separately there are survival analysis we have done in marketing analytics course, which is given in the other term. You can go there and see that there are survival analysis, which you can see to find out that what are the

patterns of retention for two different cohorts. And if I can find out that I have to be able, I can be able to target them differently.

So, just blindly saying that these are high CLV these are low CLV does not solve your purpose. You have to also further focus on this retention rate and this also comes under customer relationship management. Because, if you have different kind of retention rate how to change that retention rate and etcetera will come under customer relationship management.

So, these are very basic maths part I, this is the highest maths that we will be doing in this particular CLV calculation. I will stop here in terms of the maths and I will see that how this CLV can be applied in different. In the next week we will talk about some of the cases where it is actually applied. So, thank you very much for being with me in this particular video in the next video we will be talking about a specific topic called social CRM.