Customer Relationship Management
Prof. Swagato Chatterjee
Vinod Gupta School of Management
Indian Institute of Technology, Kharagpur

Lecture – 26
Customer Equity and CRM

Hello everybody. Welcome to the Customer Relationship Management course ah in the Swayam, NPTEL platform. This is Dr. Swagato Chatterjee from VGSOM IIT Kharagpur, who is taking this course. We are in Week 4 and in this particular video we will be discussing about Customer Equity─ consumer equity and CRM. So, how the CRM ideas and techniques can be used to explain customer equity?

So, what is customer equity? So, that is something that we have to discuss first. So, customer equity, equity is what equity is something that you can make money out of it. So, customer equity is the total amount of money that you can make out of a not one single customer, but from your all customers over the period of time.

So, I have let's say X amount of customers. If I if I sell my company towards you and I can I can I can also sell all my customers base, the customer database and etcetera and corresponding my relationship with the customer to you, then you pay me for the amount of money that money is basically customer equity. And how do you decide that money? You decide that with how much money you can make out of these existing relationship with this particular person or particular company with its customers.

For example, if I, if I give try to give an example let's say at one point of time in the market of ah call cab basically taxi market ah mobile taxi market, there was somebody called TaxiForSure. So, TaxiForSure was mainly operating in the Southern India ah Bangalore Chennai ah even, even I think they were there in ah Mumbai also. I am not sure that you can check probably, but then what the what happened is Ola bought them up.

Now, Ola what did Ola buy when the Ola buys it is competitor which is TaxiForSure, what exactly is Ola buying? Ola buying two things; one is that, it is removing the it is its competition from the market that is number one. So, it is becoming monopoly. So, it is buying the rights of not letting you do the business, but Ola also actually uses their right to slowly probably reduce their support for TaxiForSure after they buy.

So, they they wanted they did not want the, but all the contacts to go away. The customer equity they did not want to leave it. So, what they did is they from Ola and TaxiForSure both remain for in the market for some point of time. But slowly the benefits that were giving in TaxiForSure platform both to the drivers and the customers came down. So, all these customers slowly switch from from TaxiForSure to Ola.

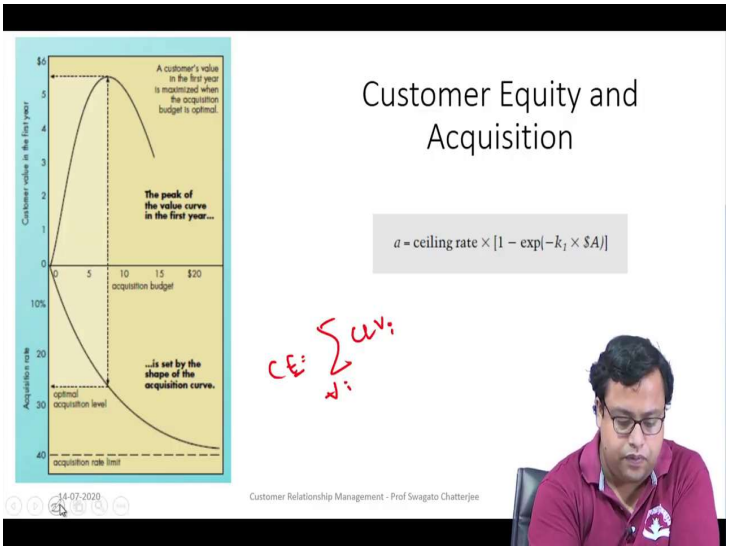
So, this customer base they did not want to the the already created customer base Ola did not want to lose that and that is why they did this strategy. So, that these guys will come and join

Ola. And there were some kind of provision some kind of benefits that they were giving to the TaxiForSure customers if they want to join Ola. So, that was their strategy.

Now, how much they were paying TaxiForSure I am not I was not there while the deal was going on, but if I were there I would have thought that the deal was majorly based on this customer base. How strong this customer base is, how much money Ola perceives to make from this customer base; that is what they are buying from taxiforsure. So, that is the customer equity that they are buying from TaxiForSure and that much money they have they would want to pay.

So, that is what customer equity is basically ─ the total amount of money, money means profit that you are expected to make from customers the whole customer base not one customer over the time period of time .

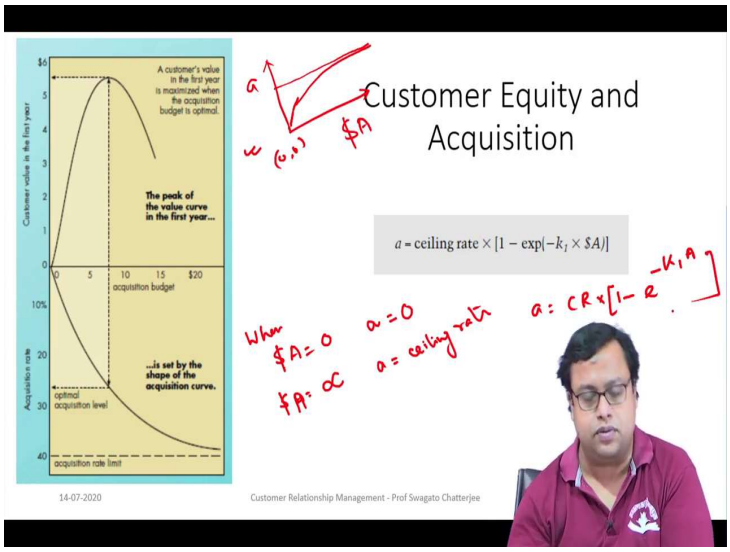
(Refer Slide Time: 04:24)



So, in other words if I can write it your customer equity , I can write is the summation of customer lifetime value of '" is customer for all i ; that can be told as your customer equity something like that it is a summation of customer lifetime value of all the customers okay.

So, now we were talking about two specific things in the customer lifetime value calculations; one is acquisition. So, acquiring new customer and another is another is retaining more customer. So, you have to acquire more customer and you have to also retain more customer.

(Refer Slide Time: 05:20)



So, this is a curve that has been taken from a Harvard case study, not case study Harvard ah article which talks about that how ah this particular acquisition cost the expenditure that you do to acquire customer that is related to customer lifetime value.

Now, you see generally, if you spend 0 to acquire customer, if you do not do any marketing, any kind of expenditure in acquiring and etcetera then you will not acquire anybody. So, the idea is that, when your acquisition spent is 0, your acquisition is also 0 . And there will always be an upper limit of acquisition. You cannot probably acquire as many customers as possible because, often times in the in the market share and etcetera some customers are not accessible at all. So, even if you do infinite or very large amount of advertisement still there will be an upper limit of this acquisition. So, we call it the *ceiling rate*.

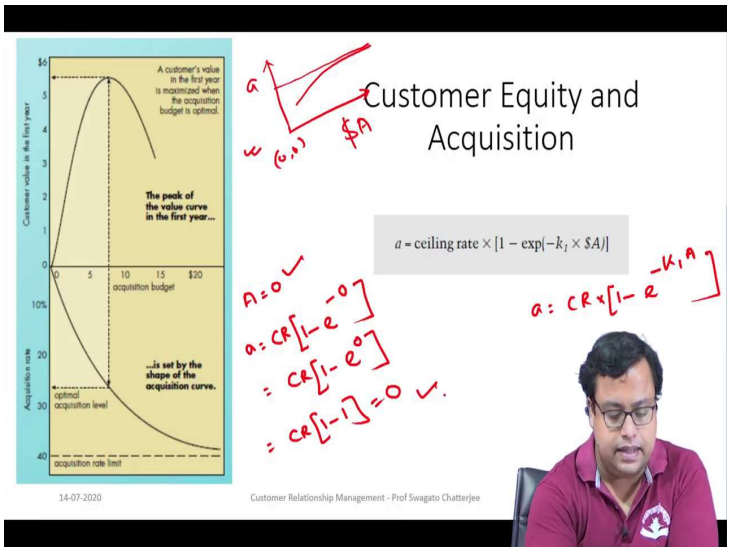
So, basically at one point it will saturate and if you one point if you saturate, then if I try to plot the acquisition and dollar acquired here basically, it will start from 0, 0 this point and at some point it will go and saturate itself something like this.

So, that kind of a curve we are expecting. Now there are lots of equations that can actually explain this kind of a curve. An equation that was given in the, the, I forgot to put the references I will put that in the file when it is shared. So, in your files you will get in the Harvard case study was basically an exponential curve exponential curve with a negative I would say power.

So, you see the equation that has been given is a is equal to ceiling rate into. So, if I write ceiling rate is **CR** , *CR into 1 minus e to the power minus k 1* capital *A*; capital *A* is the expenditure. So, this is the equation that has been written here.

So, if I just follow that if I just follow that— you check whether whatever claims I made earlier were making sense or not.

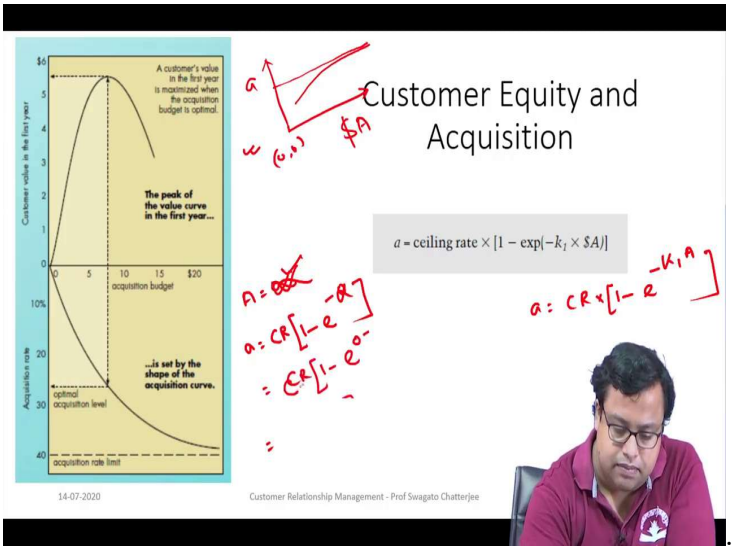
(Refer Slide Time: 08:01)



So, if capital A is 0, then what happens? This partthen, it becomes *A is equal to CR 1 minus e to the power minus 0*, this is what I get.

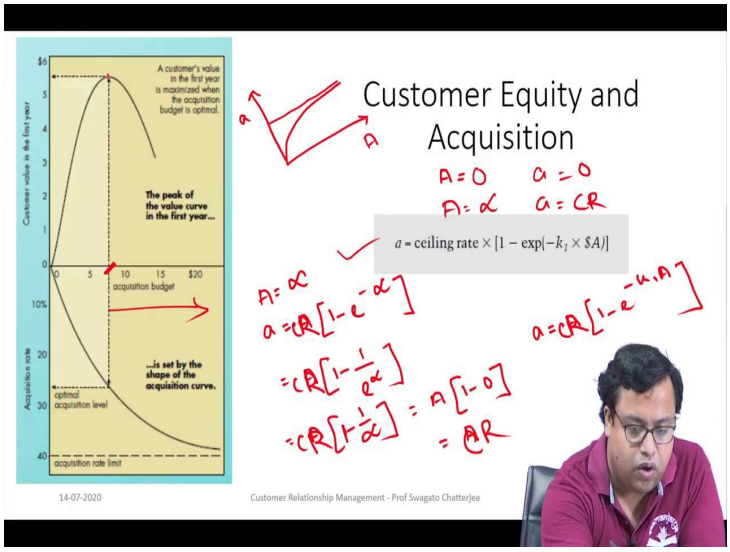
So, which is CR 1 minus e to the power 0 which is *CR 1 minus 1* in other words this is **0** . So, when you do not do any expenditure you do not get any new customer. So, that is what is settled.

(Refer Slide Time: 08:49)



Then what; then I will check that what happens if this is infinite. So, if I do lots of expenditure, if I do lots of expenditure then what do I get? Then this is also infinite; and if this is infinite then this becomes.

(Refer Slide Time: 09:14)

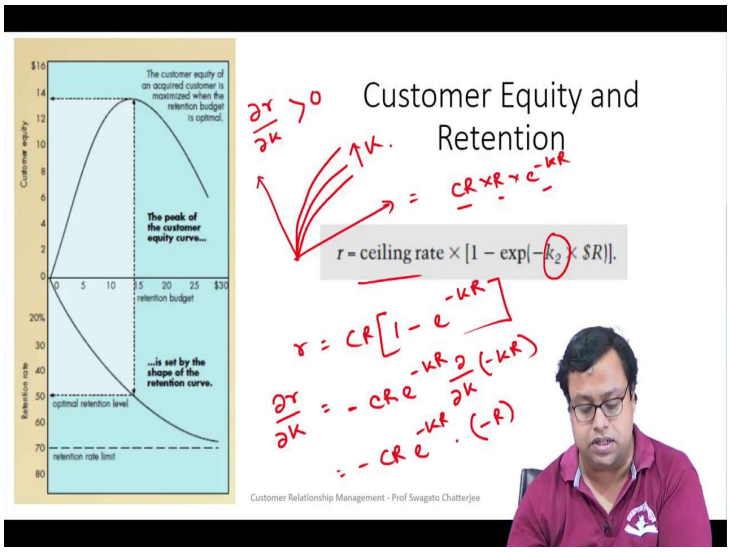


So, if the expenditure is infinite, then what happens? Then it is *A into 1 minus e to the power minus infinite*. Because minus infinite into *k1* whatever is the value of *k1* if it isfinite then this will be minus infinite; that means, is equal to *A into 1 minus e to the power minus infinite* means this. And that means; this 1 minus this and; that means, 1 minus 0 which is *A*.

So, the two things that I we started with, the two assumptions that we started with that when the advertisement expenditure will be, when the when the . So, this is CR sorry, that the advertisement expenditure if **0** then *a* is equal to 0 and advertisement expenditure is infinite then *a*, that is acquisition is equal to the ceiling rate CR. These two is solved based on the write up that I have done.

So, this particular equation ensures that this particular thing happens and that is why if you see this particular curve that has been drawn, it is drawn in the opposite direction. So, acquisition actually has a limit, if you go on increasing the, the, the, expenditure of acquisition; the ultimately it gets saturated at a point in this particular case it is saturating at **40**. And then there will be it might not be the optimal to keep on increasing there will be a certain point where it optimizes and we have to find out at what point.

(Refer Slide Time: 11:26)



The same thing applies for retention also. So, even for retention there will be a *ceiling rate*. If you go on doing the expenditure; the retention will go up, but after all you cannot retain 100%customers.

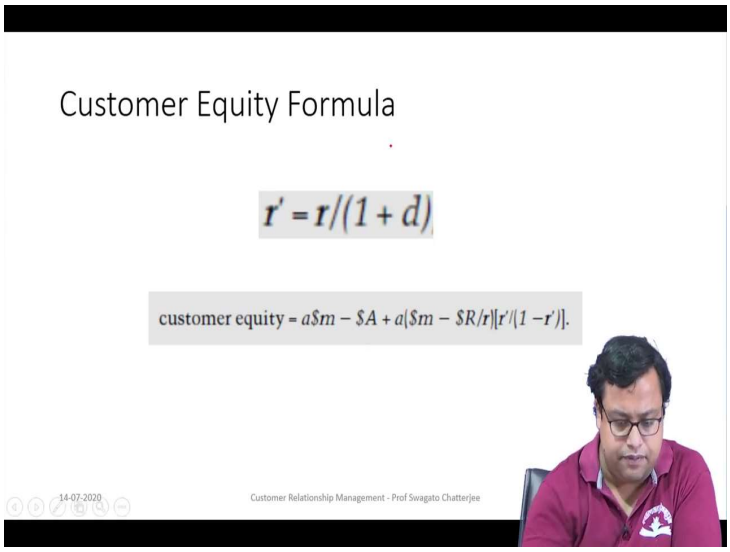
There will be some customers that irrespective of whatever money you do, in terms of retention expenditure whatever money you spend; still these customers will go out of your guys. So, that is the ceiling rate and basically *k1* and *k2* in the previous class it was *k1* and this is the *k2*. These are two constants and then no meaning of these two coefficients and you can ah there is no name of this coefficients like coefficient of this, coefficient of that this is some constant and if you understand carefully that these constants will probably make the curve becoming sharper or making the curve becoming weaker.

So, how it will do? So, just tell let me get an idea: if r is equal to CR 1 minus e to the power k ($e^{k)}$ R if I just write this, what is *del r del k*? del r del k is basically, CR will become constant. So, if you know C minus CR e to the power minus k R (e^{k-R}) this part will not be changed because, *ddx* of *ex* is *ex* itself. And then del delk of minus k r that will be my this thing. So, minus CR e to the power minus *kR* into minus R, that will be the ultimate problem. So, which is basically, *CR* into *R* into e to the power minus *kR*.

Now, see CR is the ceiling rate which is between 0 to100 positive, retention expenditure is also positive, e to the power minus *C k R* is also positive. So, basically I am trying to say that this is positive and if that is positive; that means, that k increases the retention rate increases.

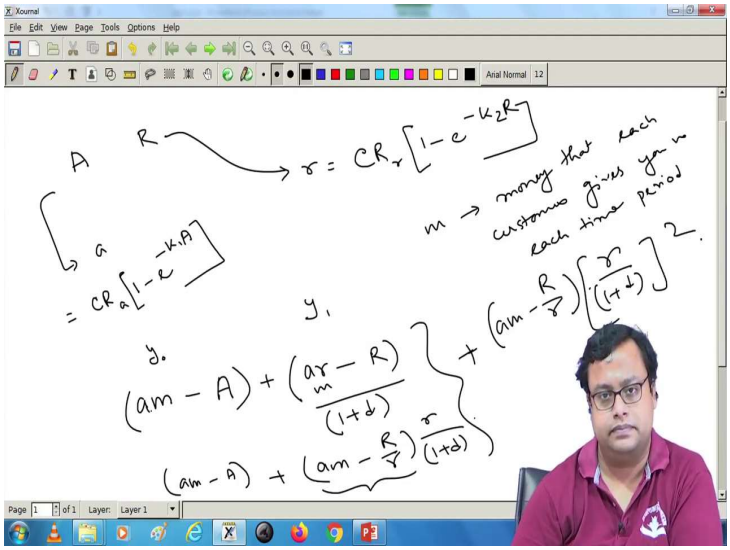
So, for the same expenditure; if you do have different kinds of k's values the curve will be slowly going up as the *k* increases. So, that kind of a job of this particular k and both for *k1* and k two the maths is simple. Now, based on this particular thing we can do the calculations of customer equity.

(Refer Slide Time: 14:13)



How we can do the calculation of customer equity? Let's say, I have done a little bit of expenditure.

(Refer Slide Time: 14:27)



Let's say, I have decided that I will do expenditure capital A and R. By expenditure capital A, I got small a which is capital rate of acquisition into 1 minus e to the power minus *k1,A* based on the formula. Similarly, by retention expenditure I got some people to be retaining. So, *CR of r* retention minus *e1 k2* into *R*; this is what I know. So, every first time I have done the

acquisition and then every year I am retaining this customer by doing that expenditure of small *r*. I have to decide that how much money I will make.

So, if you see that let's say another assumption is; *m* dollar m is the money that each customer gives you in each time period okay. So, *a* is the money that each customer. So, in the first time period how much money do I get the first time period I get *a* into *m* minus capital *A* in because in the first time period acquisition happens and *a* into m is the money that you generate. a number of people are acquired and they spend m number of money m amount of money.

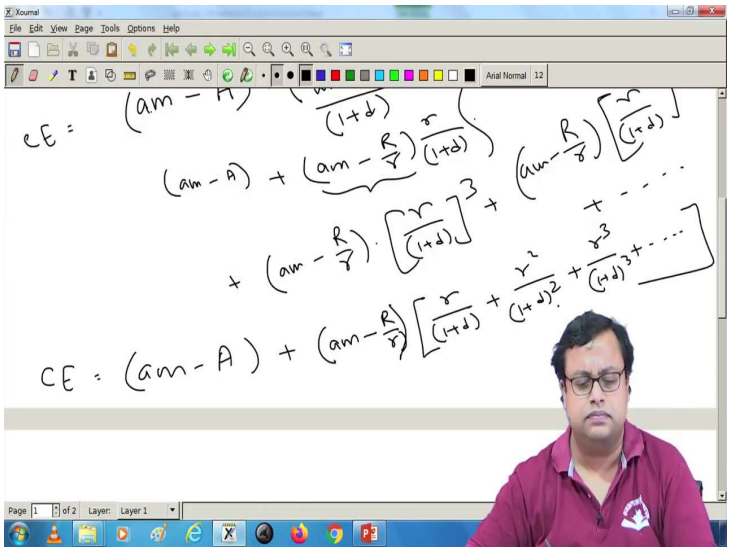
So, *a* into m minus *A* is the first years net profit. In the second year how much do I make in the second year? I make you have to understand that I in I make basically out of this a into r number of customers stays back okay, *a into r* number of customer stays back by capital *R* is the expenditure right.

If you are if you are with me, *a into r* number of customers stays back and capital *R* is the expenditure and then that many customers pays me *m* amount of money. So, basically no — so, all these guys pays me m amount of money *ar m* minus capital *R* this much money this many people spend me m amount of money.

And how much will be the cost that divided by *1* plus *d*. If *d* is the discounted discounting rate this much money in the current value; if it is year *0*, this is year *1*, this much money is the current value or if I write like this a m minus *A* I take r common then it becomes a m divided by capital *R* by small r into *r* by *1* plus *d* . I just take r common from the numerator, this is in year 1. Fair enough this is in year 1.

Now, what do I do in year 2? I make the same amount of money in year 2 this only, but into another r plus one by *d*. So, in the second year onwards in the second year onwards I make I make a *m divided by capital r by small r into r by 1 plus d square* of that .

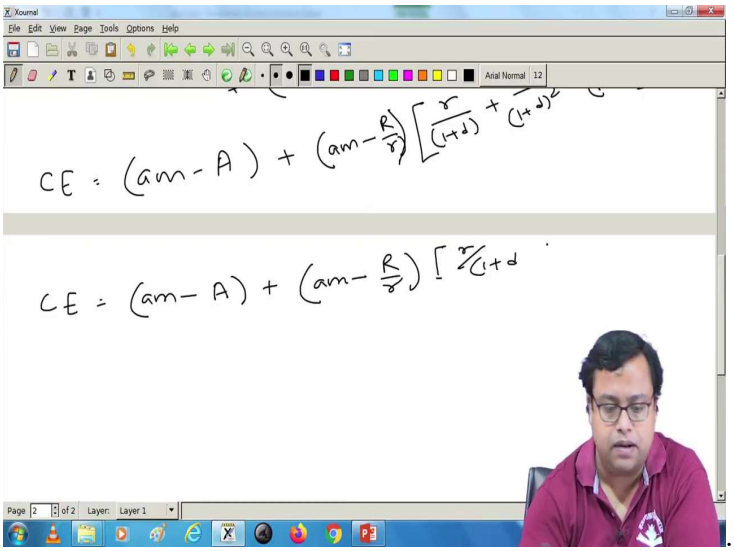
(Refer Slide Time: 18:18)



And in the third year I do a m into capital *R minus small r into r by 1 plus d cube* of that. And then *am into capital R by small r by r plus 1 plus d* this and so on. I go on doing this, go on doing this.

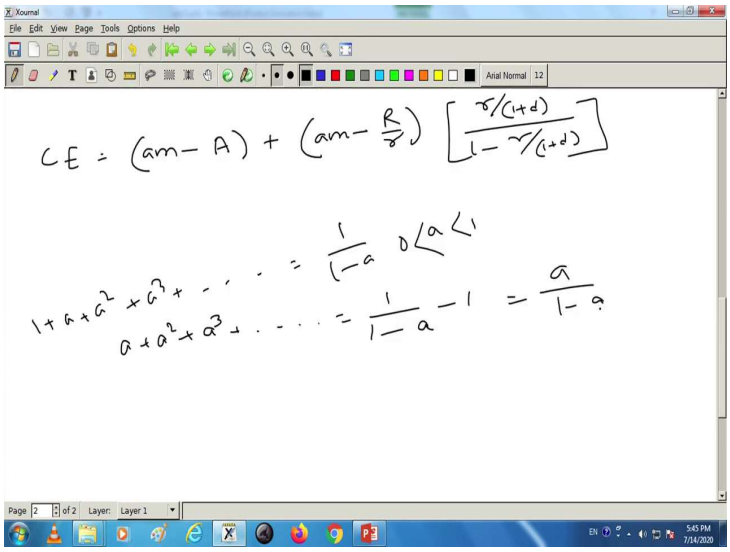
So, if I write it carefully if you write just check that total customer equity just check is equal to just check whatever I am writing, I will take this part as common then the first one will be – then this and so on, am I okay?

(Refer Slide Time: 19:31)



So, then, you have to understand that this is small. So, this is smaller than 1. So, this formula will be *1 by 1 minus a* that is the formula *1 by 1 minus a*.

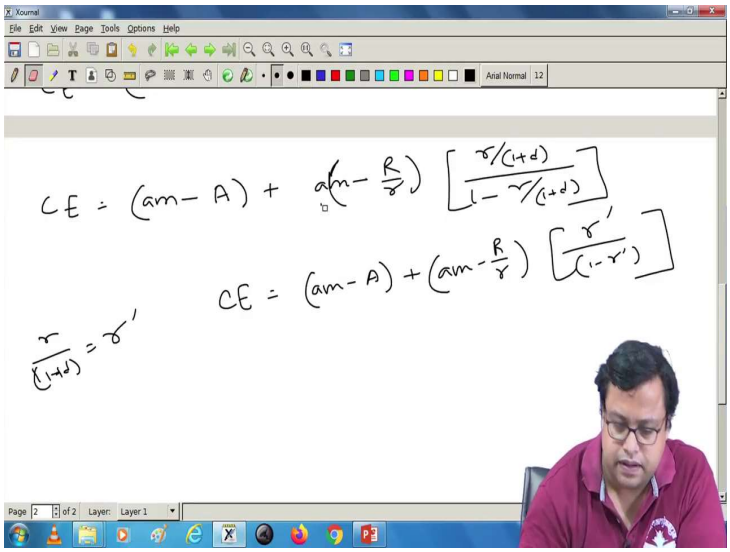
(Refer Slide Time: 19:57)



But, that is the formula only when it is *1 plus a plus a square plus a cube* this formula is *1 by 1 minus a*; probably, *a* is smaller than *1* . Fair enough; *a* is, a, *a* is between *0* and *1*. It is an infinite series of a fraction.

But, in our case it was a plus a square plus a cube something like this. It did not start with *1*, it started with the fraction. So, this is nothing, but this minus 1 which is basically *a by 1 minus a* . So, in our case it will be *r by 1 plus d* divided by *1 minus r by 1 plus d* . Are you with me? Using this formula just check the maths.

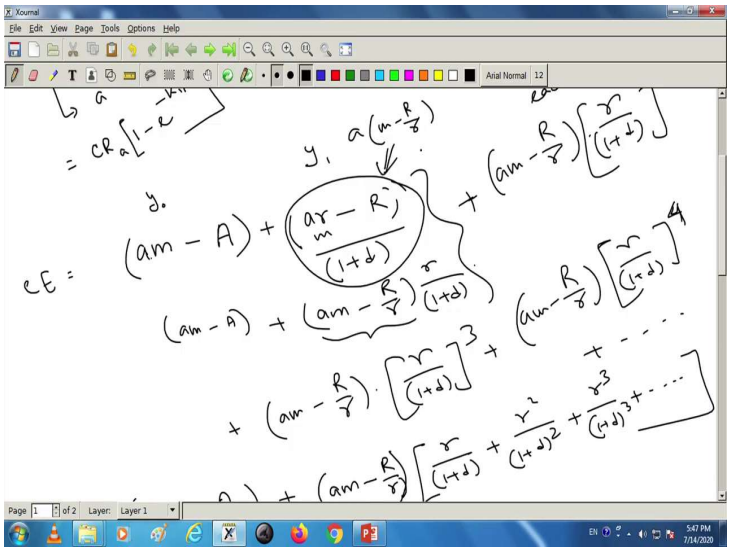
(Refer Slide Time: 21:02)



And if that is true if that part of the maths is true then I can just write *r by one plus d* as *r dashed* and then CE is equal to in that case; *a* m minus **A** *plus a m minus capital R by small r into r dash divided by 1 minus r dashed* . So, that's the formula that has been written here, there is the same formula that has been written here, you check.

So, *a* has been taken common and then *m minus capital R by small r and* okay. So, this is actually a little bit. So, this will be like this, this will be like something like this you have to check it here.

(Refer Slide Time: 21:50)



I think I have done some mistake here. It should be *a into m by R minus r* something like that at this point. So, that is the formula for customer equity when you do both expenditure in terms of ah acquisition and expenditure in terms of retention and you do the calculation for the lifetime.

But again the problem is the real life situation, if we do not do this particular calculation for the lifetime. We do this calculation for a certain period of time and that certain period of time will require a little bit of calculation for k1 and k2. We will do that in the next video with the data set.

So, thank you for being with me in this particular video and I will see you in the next video with calculation when in a limited time span, you have acquisition spend and retention spend, how you can optimally choose the acquisition spend and retention spend. So, that you want to improve your customer lifetime value or customer equity.

Thank you very much. See you in the next video

.