Home Alarm case write-up

Yuhan Xu 474154

1. What is the LTV (looking 8 years out) of a customer who will use auto-pay? (7 points)

$1585.29

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9		
revenue	480	494.4	509.232	524.509	540.2442	556.4516	573.1451	590.3395	×	103.00%
cost of service	72	74.16	76.3848	78.67634	81.03663	83.46773	85.97177	88.55092	×	103.00%
MKT cost	24	24.72	25.4616	26.22545	27.01221	27.82258	28.65726	29.51697	×	103.00%
profit	384	395.52	407.3856	419.6072	432.1954	445.1612	458.5161	472.2716	revenue - cost of service - MKT cost	
probability of being active	93.00%	0.83979	0.753292	0.681729	0.628554	0.585184	55.07%	52.15%	Y(n-1)*(1-attrition rate of year n)	
profit expected on average	357.12	332.1537	306.8802	286.0583	271.6582	260.5012	252.4855	246.2769	profit * probability	
discount rate	1.1	1.21	1.331	1.4641	1.61051	1.771561	1.948717	2.143589	1.1^(n-1)	
present value	324.6545	274.5072	230.5636	195.3817	168.6783	147.0461	129.565	114.89	profit * discount rate	
	LTV	1585.287	total present value							

2. What is the LTV (looking 8 years out) of a customer who will not use auto-pay? (7 points)

$1291.75

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9		
revenue	480	494.4	509.232	524.509	540.2442	556.4516	573.1451	590.3395	×	103.00%
cost of service	72	74.16	76.3848	78.67634	81.03663	83.46773	85.97177	88.55092	×	103.00%
MKT cost	24	24.72	25.4616	26.22545	27.01221	27.82258	28.65726	29.51697	×	103.00%
profit	384	395.52	407.3856	419.6072	432.1954	445.1612	458.5161	472.2716	revenue - cost of service - MKT cost	
probability of being active	87.80%	0.735764	0.622456	0.539047	47.44%	0.421707	38.12%	34.84%	Y(n-1)*(1-attrition rate of year n)	
profit expected on average	337.152	291.0094	253.5798	226.1881	205.0169	187.7278	174.7971	164.5575	profit * probability	
discount rate	1.1	1.21	1.331	1.4641	1.61051	1.771561	1.948717	2.143589	1.1^(n-1)	
present value	306.5018	240.5036	190.5182	154.4895	127.2993	105.9674	89.69855	76.76728	profit * discount rate	
	LTV	1291.746	total present value							

3. What is the maximum amount that Home Alarm could spend on incentives to convert such an existing customer to auto-pay? (6 points)

The difference between the two LTVs calculated in question 1 and 2 is the maximum amount.

The maximum amount is $293.54. As long as Home Alarm spends less than that amount to convert an existing customer to auto-pay, the LTV of that customer will increase.

4. Suggest at least three marketing actions that Home Alarm should consider to convert existing customers who are just about to start their second year with Home Alarm to auto-pay. Be specific about incentive amounts (if any). (10 points)

(1) The company can give gift cards for the first n customers who start using auto-pay. The value of the gift cards should be less than $293.54 *n/N. (N: the total amount of customers who didn't start using auto-pay)

(2) The company can send Email or call the customers and tell them about auto-pay and the benefits of using it. Moreover, they can let customers who start using auto-pay have a chance to receive gifts that value less than $293.54.

(3) The company can give customers who start using auto-pay some discounts. After calculations, giving a discount of 10% will result in an LTV of $1387.13. Giving a discount of 15% will result in an LTV of $1288.05. Giving a discount of 14% will result in an LTV of $1307.86.

Therefore, a discount less than 14% will give customers incentives to convert to auto-pay without earning less LTV than LTV of not using auto-pay.

(Auto-pay with 10% off)

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9		
revenue	480	494.4	509.232	524.509	540.2442	556.4516	573.1451	590.3395	×	103.00%
after discount	432	444.96	458.3088	472.0581	486.2198	500.8064	515.8306	531.3055	×	(1-10%)
cost of service	72	74.16	76.3848	78.67634	81.03663	83.46773	85.97177	88.55092	×	103.00%
MKT cost	24	24.72	25.4616	26.22545	27.01221	27.82258	28.65726	29.51697	×	103.00%
profit	336	346.08	356.4624	367.1563	378.171	389.5161	401.2016	413.2376	revenue - cost of service - MKT cost	
probability of being active	93.00%	0.83979	0.753292	0.681729	0.628554	0.585184	55.07%	52.15%	Y(n-1)*(1-attrition rate of year n)	
profit expected on average	312.48	290.6345	268.5201	250.3011	237.7009	227.9385	220.9249	215.4923	profit * probability	
discount rate	1.1	1.21	1.331	1.4641	1.61051	1.771561	1.948717	2.143589	1.1^(n-1)	
present value	284.0727	240.1938	201.7432	170.959	147.5936	128.6654	113.3694	100.5288	profit * discount rate	
	LTV	1387.126	total present value							

(Auto-pay with 15% off)

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9		
revenue	480	494.4	509.232	524.509	540.2442	556.4516	573.1451	590.3395	×	103.00%
after discount	408	420.24	432.8472	445.8326	459.2076	472.9838	487.1733	501.7885	×	(1-15%)
cost of service	72	74.16	76.3848	78.67634	81.03663	83.46773	85.97177	88.55092	×	103.00%
MKT cost	24	24.72	25.4616	26.22545	27.01221	27.82258	28.65726	29.51697	×	103.00%
profit	312	321.36	331.0008	340.9308	351.1587	361.6935	372.5443	383.7206	revenue - cost of service - MKT cost	
probability of being active	93.00%	0.83979	0.753292	0.681729	0.628554	0.585184	55.07%	52.15%	Y(n-1)*(1-attrition rate of year n)	
profit expected on average	290.16	269.8749	249.3401	232.4224	220.7223	211.6572	205.1445	200.1	profit * probability	
discount rate	1.1	1.21	1.331	1.4641	1.61051	1.771561	1.948717	2.143589	1.1^(n-1)	
present value	263.7818	223.0371	187.3329	158.7476	137.0512	119.475	105.2716	93.34813	profit * discount rate	
	LTV	1288.045	total present value							

(Auto-pay with 14% off)

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9		
revenue	480	494.4	509.232	524.509	540.2442	556.4516	573.1451	590.3395	×	103.00%
after discount	408	420.24	432.8472	445.8326	459.2076	472.9838	487.1733	501.7885	×	(1-15%)
cost of service	72	74.16	76.3848	78.67634	81.03663	83.46773	85.97177	88.55092	×	103.00%
MKT cost	24	24.72	25.4616	26.22545	27.01221	27.82258	28.65726	29.51697	×	103.00%
profit	312	321.36	331.0008	340.9308	351.1587	361.6935	372.5443	383.7206	revenue - cost of service - MKT cost	
probability of being active	93.00%	0.83979	0.753292	0.681729	0.628554	0.585184	55.07%	52.15%	Y(n-1)*(1-attrition rate of year n)	
profit expected on average	290.16	269.8749	249.3401	232.4224	220.7223	211.6572	205.1445	200.1	profit * probability	
discount rate	1.1	1.21	1.331	1.4641	1.61051	1.771561	1.948717	2.143589	1.1^(n-1)	
present value	263.7818	223.0371	187.3329	158.7476	137.0512	119.475	105.2716	93.34813	profit * discount rate	
	LTV	1288.045	total present value							