Requirements Engineering 2019/20

MyPet

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Feasibility analysis

Candidates

- CANDIDATE 1: Pay an external company to develop all the platform
- CANDIDATE 2: Internal development of the platform
- CANDIDATE 3: Buy both an external app and an existing collar technology and merge them into a single platform

Candidates

In all these cases, we want the final product to be a single platform composed by:

- A back-end module based on a microservices architecture
- A front-end Android application
- A front-end iOS application
- A collar that provides the data about pet's vital functions and pet's position
  - An external company will take charge of the collars' production and assembly
  - We assume they are familiar with the production of this kind of technology
  - We assume we can reach an agreement with them, so that they will produce for us the collars and we will buy an incremental number of collars every year

Benefits

- We sketched a very simple business plan:
  - Both Android and iOS applications will be totally free to use and without advertisements inside
  - The main profits will be related with veterinarian subscriptions
    - Free subscription for the first year after the official release date
    - Paid subscription from the second year after the official release at a cost of $60.00/year
    - Free subscription for the second year after the official release date only for the first 50 subscriptors
    - The cost of the subscription per year can be increased according to the success of the platform

Benefits

- Other profits will be related with collars' sales
  - Assuming that each collar can be produced at a cost of $25.00, so we expect to sell them to the veterinarians at a cost of $70.00/collar.
  - We can also impose the resale's price of each collar at a maximum cost of $100.00.
- We can also plan a beta-testing phase along all the development period; in this way, considering to use an agile approach, we can include a free testing phase that covers all the releases
  - We can consider to deploy the different releases on our relatives' devices, so they can use it in their daily routine and give us their feedback.

CANDIDATE 1
External company develops all the platform

CANDIDATE 1 – Operational Feasibility

All requirements can be implemented and satisfied

CANDIDATE 1 – Technical Feasibility

- Members number: 2-4
- Duration time: 2 months
- Effort:
  - Android 0.75 person months
  - Swift 0.75 person months
  - Back-end 2 person months
  - Collar 0.5 person months

CANDIDATE 1 – Schedule Feasibility

- This option does not require any kind of training for us, and so the only contraint is the development time, that is connected to the external company.
- Anyway, we estimated a development time of about 2 months according to the technical feasibility study; this evaluation also affects the economic feasibility study, because we estimate the costs needed to obtain the final product within this period.

CANDIDATE 1 – Economic Feasibility Development costs

Nr.	Product	Cost ($)
1	Android developer (120 hrs per 40 $/hr)	4,800
1	Swift developer (120 hrs per 50 $/hr)	6,000
1	Back-end developer (320 hrs per 70 $/hr)	22,400
1	Collar configuration expert (80 hrs per 75 $/hr)	6,000
	Total amount	39,200

CANDIDATE 1 – Economic Feasibility
Annual operating costs

Nr.	Product	Cost ($)
1	Bug fix technical assistance	0
1	Feature addition technical assistance (80 hrs per 50 $/hr)	4,000
	Total amount	4,000

CANDIDATE 1 – ROI Calculation

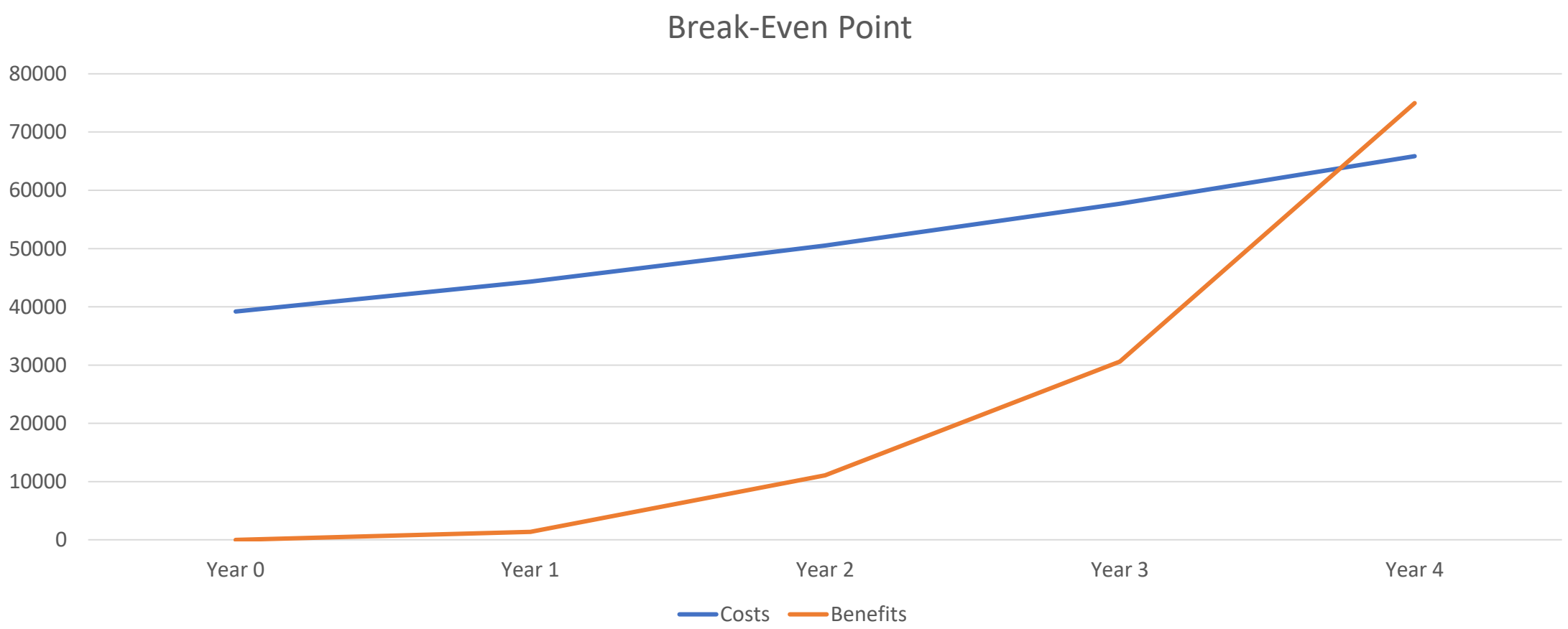
- We assume to achieve, after 1 year, 100 subscriptions
- During the second year, we expect that the number of subscriptions increases of 50 units and the veterinarians start promoting the platform
- During the third year, we expect that the number of subscriptions deadlocks, but the number of collar sales increases because of the sponsoring
- During the fourth year, we expect the main exploit of the number of subscriptions, and so also the number of collar sales increases

	Year 0	Year 1	Year 2	Year 3	Year 4
Development costs	($39,200)	$0	$0	$0	$0
Operating annual costs	$0	($4,000)	($4,000)	($4,000)	($4,000)
Collars	$0	(50*$25)	(100*$25)	(150*$25)	(200*$25)
Costs amount	($39,200)	($5,250)	($6,500)	($7,750)	($9,000)
Present Value	1	0.976	0.952	0.929	0.906
Time-adj costs	($39,200)	($5,124)	($6,188)	($7,200)	($8,154)
Cumulative costs	($39,200)	($44,324)	($50,512)	($57,712)	($65,866)
Subscription benefits	$0	$0	100*$60	175*$60	350*$100
Collar sales	$0	20*$70	60*$70	150*$70	200*$70
Benefits amount	$0	$1,400	$10,200	$21,000	$49,000
Time-adj costs	$0	$1,366	$9,710	$19,509	$44,394
Cumulative benefits	$0	$1,366	$11,076	$30,585	$74,979
Total amount	($39,200)	($42,958)	($39,436)	($27,127)	$9,113

CANDIDATE 1 – ROI Calculation

	Year 1	Year 2	Year 3	Year 4
Cumulative costs	($44,324)	($50,512)	($57,712)	($65,866)
Cumulative benefits	$1,366	$11,076	$30,585	$74,979
Cumulative profits	($42,958)	($39,436)	($27,127)	$9,113
ROI	-97%	-78%	-47%	14%
Payback period reached after 3,75 years				

CANDIDATE 1 – ROI Calculation



CANDIDATE 2
Internal development of the platform

CANDIDATE 2 – Operational Feasibility

All requirements can be implemented and satisfied

CANDIDATE 2 – Technical Feasibility

All platform is developed internally

- Members number: 2
- Duration time: 4 months
- Effort:
  - Android 1 person month
  - Swift 2.5 person months
  - Back-end 3 person months
  - Collar 1 person month

Back-end and Android application are developed internally, but iOS application is developed by an external expert

- Members number: 3
- Duration time: 3 months
- Effort:
  - Android 1 person month
  - Swift 0.75 person months
  - Back-end 3 person months
  - Collar 1 person month

CANDIDATE 2 – Schedule Feasibility

All platform is developed internally

- Swift requires 1 person month for training and 1.5 person months for development
- Collar configuration requires 0.5 person months for training and 0.5 person months for implementation

Back-end and Android application are developed internally, but iOS application is developed by an external expert

- Collar configuration requires 0.5 person months for training and 0.5 person months for implementation

CANDIDATE 2 – Economic Feasibility Development costs

All platform is developed internally		
Nr.	Product	Cost ($)
1	Development costs	0
1	Facilities costs	0
1	Swift training	200
2	IntelliJ IDEA license	298
1	Android account	25
1	iOS account	99
1	Amazon AWS	150
1	Collar training	0
1	Collar	25
	Total amount	797

CANDIDATE 2 – Economic Feasibility Development costs

Back-end + Android developed internally and iOS developed externally		
Nr.	Product	Cost ($)
1	Development costs	0
1	Swift developer (120 hrs per 50 $/hr)	6000
1	Facilities costs	0
2	IntelliJ IDEA license	298
1	Android account	25
1	iOS account	99
1	Amazon AWS	150
1	Collar training	0
1	Collar	25
	Total amount	6,597

CANDIDATE 2 – Economic Feasibility
Annual Operating costs

Nr.	Product	Cost ($)
2	IntelliJ IDEA license	298
1	iOS account	99
1	Amazon AWS	150
1	Technical support	0
	Total amount	547

CANDIDATE 2 – ROI Calculation

- We expect a trend very similar to CANDIDATE 1’s trend.
- However, we expect that our platform will be a little bit less successful among the users; the main reason is connected with the difference between a senior development team’s capabilities and experience and ours.

All platform is developed internally					
	Year 0	Year 1	Year 2	Year 3	Year 4
Development costs	($797)	$0	$0	$0	$0
Operating annual costs	$0	($547)	($547)	($547)	($547)
Collars	$0	(50*$25)	(100*$25)	(150*$25)	(200*$25)
Costs amount	($797)	($1,797)	($3,047)	($4,297)	($5,547)
Present Value	1	0.976	0.952	0.929	0.906
Time-adj costs	($797)	($1,754)	($2,901)	($3,992)	($5,026)
Cumulative costs	($797)	($2,251)	($5,152)	($9,144)	($14,170)
Subscription benefits	$0	$0	90*$60	160*$60	325*$100
Collar sales	$0	20*$70	55*$70	140*$70	180*$70
Benefits amount	$0	$1,400	$9,250	$19,400	$45,100
Time-adj costs	$0	$1,366	$9,065	$18,704	$43,916
Cumulative benefits	$0	$1,366	$10,431	$29,135	$73,051
Total amount	($797)	($885)	$5,279	$19,991	$58,881

Back-end + Android developed internally and iOS developed externally					
	Year 0	Year 1	Year 2	Year 3	Year 4
Development costs	($6,597)	$0	$0	$0	$0
Operating annual costs	$0	($547)	($547)	($547)	($547)
Collars	$0	(50*$25)	(100*$25)	(150*$25)	(200*$25)
Costs amount	($6,597)	($1,797)	($3,047)	($4,297)	($5,547)
Present Value	1	0.976	0.952	0.929	0.906
Time-adj costs	($6,597)	($1,754)	($2,901)	($3,992)	($5,026)
Cumulative costs	($6,597)	($8,351)	($11,252)	($15,244)	($20,270)
Subscription benefits	$0	$0	90*$60	160*$60	325*$100
Collar sales	$0	20*$70	55*$70	140*$70	180*$70
Benefits amount	$0	$1,400	$9,250	$19,400	$45,100
Time-adj costs	$0	$1,366	$9,065	$18,704	$43,916
Cumulative benefits	$0	$1,366	$10,431	$29,135	$73,051
Total amount	($6,597)	($6,985)	($821)	$13,911	$52,781

CANDIDATE 2 – ROI Calculation

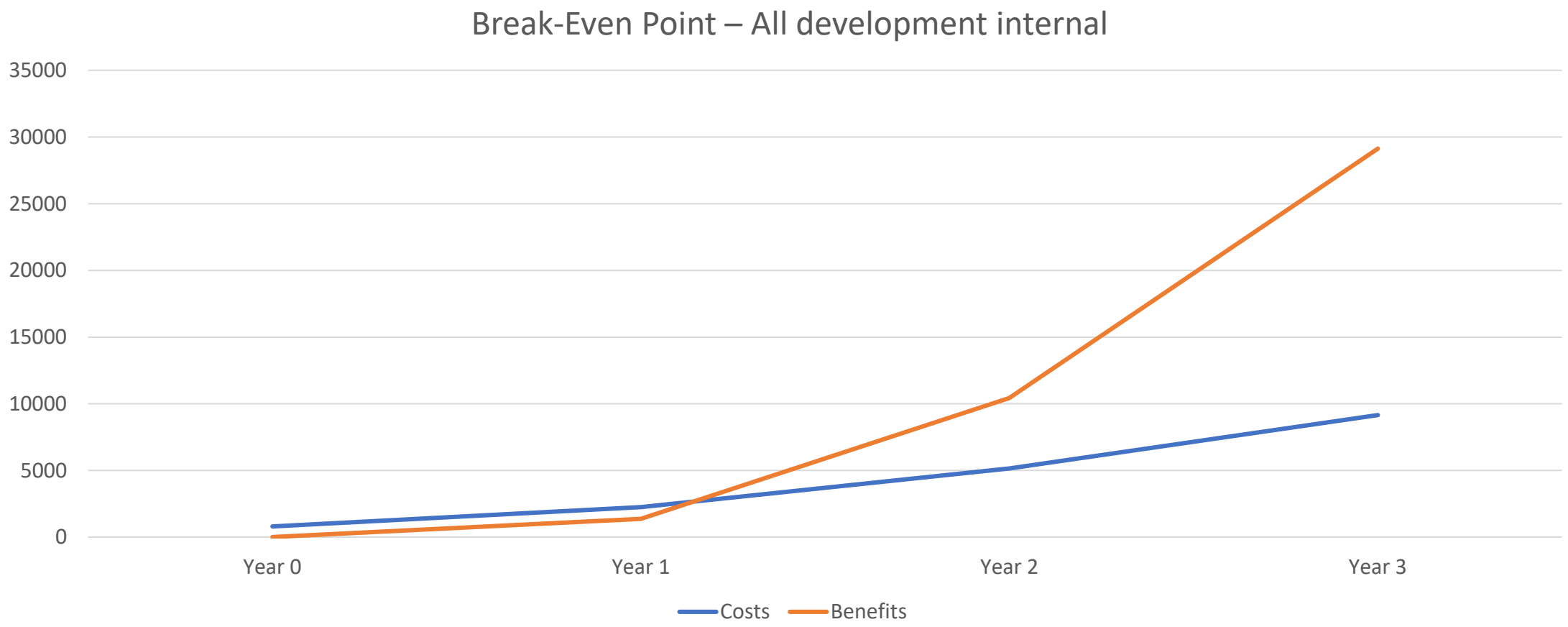
All platform is developed internally

	Year 1	Year 2	Year 3	Year 4
Cumulative costs	($2,251)	($5,152)	($9,144)	($14,170)
Cumulative benefits	$1,366	$10,431	$29,135	$73,051
Cumulative profits	($885)	$5,279	$19,991	$58,881
ROI	-39%	102%	219%	415%
Payback period reached after 1.3 years				

Back-end and Android application are developed internally, but iOS application is developed by an external expert

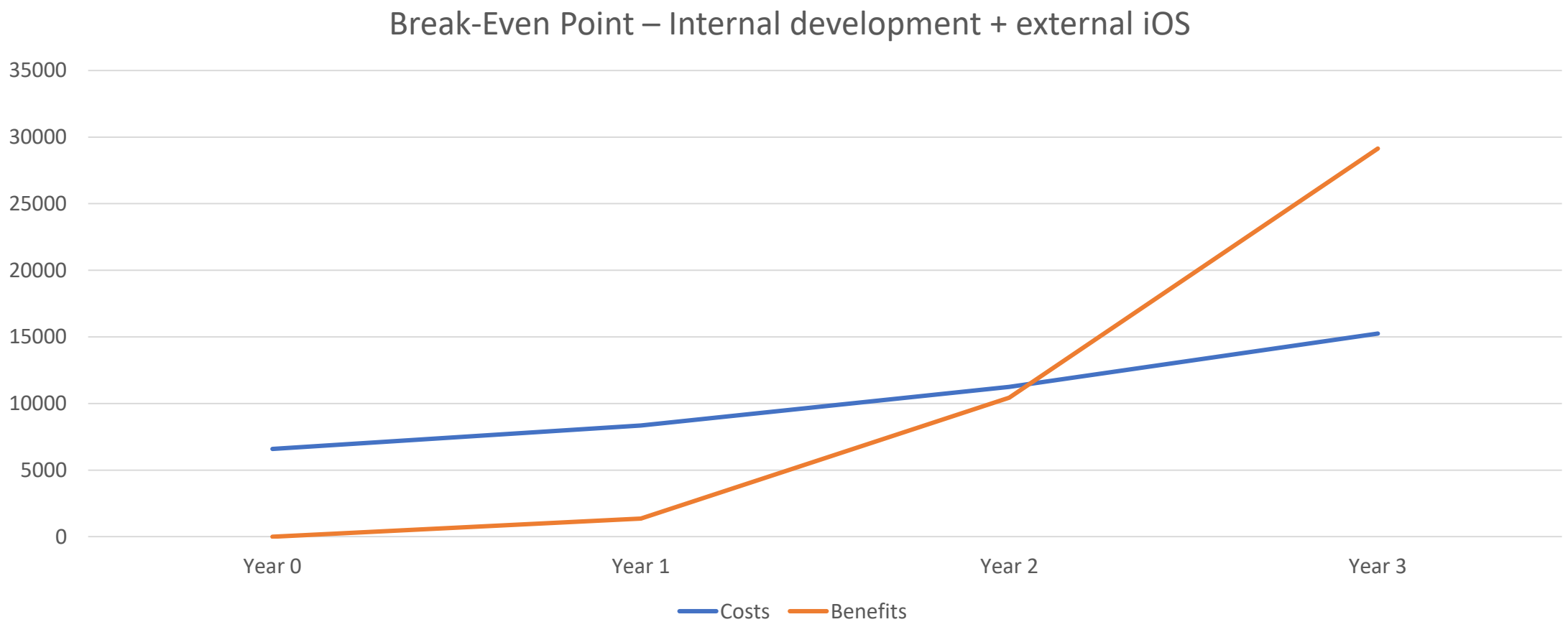
	Year 1	Year 2	Year 3	Year 4
Cumulative costs	($8,351)	($11,252)	($15,244)	($20,270)
Cumulative benefits	$1,366	$10,431	$29,135	$73,051
Cumulative profits	($6,985)	($821)	$13,911	$52,781
ROI	-84%	-7%	91%	260%
Payback period reached after 2.42 years				

CANDIDATE 2 – ROI Calculation



The year 4 trend is not shown because, with this chart, we want to focus on the break-even point; with the addition of the year 4 data, the chart would have seemed more flat

CANDIDATE 2 – ROI Calculation



The year 4 trend is not shown because, with this chart, we want to focus on the break-even point; with the addition of the year 4 data, the chart would have seemed more flat

CANDIDATE 3
Purchase and merging of two existing technologies

CANDIDATE 3 – Operational Feasibility

‘11pets: Pet care’ is a mobile application already available on Google Play Store.

Acquiring it, we can only satisfy the requirements not concerning with the use of the collar.

If we want to satisfy all the requirements, we should buy a tech collar and its integrated application; then we should merge the two applications into one.

We are not able to estimate times and costs to develop this solution.

Summary

Feasibility criteria	Wt	CANDIDATE 1	CANDIDATE 2		CANDIDATE 3
			Internal	Internal + iOS	
Operational	30%	Score: 100	Score: 100	Score: 100	Score: 50
Technical	30%	Score: 95	Score: 70	Score: 80	Score: 0
Economic	30%	Score: 30	Score: 95	Score: 75	Score: 0
Schedule	10%	Score: 95	Score: 85	Score: 90	Score: 0
Ranking	100%	77	88	85.5	15

Conclusions

- In conclusion, we can state that the best alternative is the CANDIDATE 2; in particular, the best choice is the one that assumes all the components of the platform developed internally.
- In particular, in this case we can consider delay in time less important than economic costs, because many concurrent products are already present in the marketplace.