DESIGN THINKING CASE STUDY

(a) Using four evaluation tools that you have learnt, evaluate whether this project is worth investing in.

(Hint: Remember that you must discount all future values to its present value)

Net Present Value (NPV)

Future Value ($):

Discount/Inflation Rate (%):

Number of Years:

Compound Interval:

Calculate Reset

SOLUTION

EasyTech.

We must first discount each year's cash flow to its present value (Year 2019), we can then add all the present values to get a total present value of $15,443,469.86 which we then deduct the initial investment of $15,000,000 to get the Net Present Value of EasyTech to be $443,469.86.

As the NPV is positive, the company should invest in EasyTech.

(Calculation formula for NPV for EasyTech)

EasyTechX.

Like EasyTech, we must first discount each year's cash flow to its present value. (Year 2019) However, EasyTechX's cash flows only start from Year 2024 and therefore the cash flows for the first four years are $0.

After finding each year's present value, we can then add all the present values to get a total present value of $15,881,726.09 which we then deduct the initial investment of $14,000,000 to get the Net Present Value of EasyTechX to be $1,881,726.09.

As the NPV is positive, the company should invest in EasyTechX.

(Calculation formula for NPV for EasyTechX)

Internal Rate of Return (IRR)

SOLUTION

IRR calculation cannot be done on a traditional calculator.
IRR requires either a financial calculator or Microsoft Excel to calculate.

EasyTech.

(Calculation formula for IRR for EasyTech)

Using Microsoft Excel as shown above we get EasyTech's IRR to be 5.60%. This is higher than the company's cost of funding (5%), therefore the company should invest in EasyTech.

EasyTechX.

As mentioned in NPV, EasyTechX's cash flow only starts from Year 2024 onwards thus the first four year's cash flow are $0.

(Calculation formula for IRR for EasyTechX)

Using Microsoft Excel as shown above we get EasyTechX's IRR to be 7.32%. This is higher than the company's cost of funding (5%), therefore the company should invest in EasyTechX.

Profitability Index (PI)

SOLUTION

EasyTech.

Same as NPV, we must first discount each year's cash flow to its present value. (Year 2019)

After finding each year's present value (Year 2019), we can then add all the present values to get a total present value of $15,443,469.86.

Dividing the total present value by the initial investment will give us the Profitability Index for EasyTech.

(Calculation for PI of EasyTech)

As the Profitability Index of EasyTech (1.03) is more than 1, the company should invest in this project as it generates higher returns than the investment required.

EasyTechX.

Doing the same for EasyTechX, we must add all the present value to get a total present value of $15,881,726.09.

Dividing the total present value by the initial investment will give us the Profitability Index for EasyTechX.

As the Profitability Index of EasyTechX (1.13) is more than 1, the company should invest in this project as it generates higher returns than the investment required.

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Payback Period (PP) (Equal Cash Flow)

Investment Required:

Cash Flow Per Period:

Calculate Reset

Payback Period (PP) (Non-Equal Cash Flow)

Period before Full Recovery of Investment:

Unrecovered Investment at Start of Period:

Cash Flow for the Period:

Calculate Reset

SOLUTION

EasyTech.

The Payback Period for EasyTech is 7.5 years which is lower than the company's required Payback Period of 10 years, the company should invest in EasyTech.

(Formula)

The Payback Period for EasyTech is 7.5 years which is lower than the company's required Payback Period of 10 years, the company should invest in EasyTech.

EasyTechX.

As the cash flows for EasyTechX are not equal, we must use this formula to calculate the Payback Period of for EasyTechX:

(Formula)

The Payback Period for EasyTechX is 9.60 years which is lower than the company's required Payback Period of 10 years, the company should invest in EasyTechX.

(b) Assume that Tom managed to get funding for investments in both EasyTech and EasyTechX, and both technologies can generate returns as shown below

What are Accounting Rates of Returns (ARR) of both projects?

Average Annual Earnings:

Initial Investment in Project:

Calculate Reset

Average Annual Earnings:

Average Book Value of Project:

Calculate Reset

SOLUTION

EasyTech.

Using both ARR formulas we can calculate the ARR for EasyTech:

(Formula)

As both formulas for ARR of EasyTech are higher than the company's required rate of return on all projects (30%), the company should invest in EasyTech.

EasyTechX.

Using both ARR formulas we can calculate the ARR for EasyTechX:

(Formula)

As both formulas for ARR of EasyTechX are higher than the company's required rate of return on all projects (30%), the company should invest in EasyTechX.