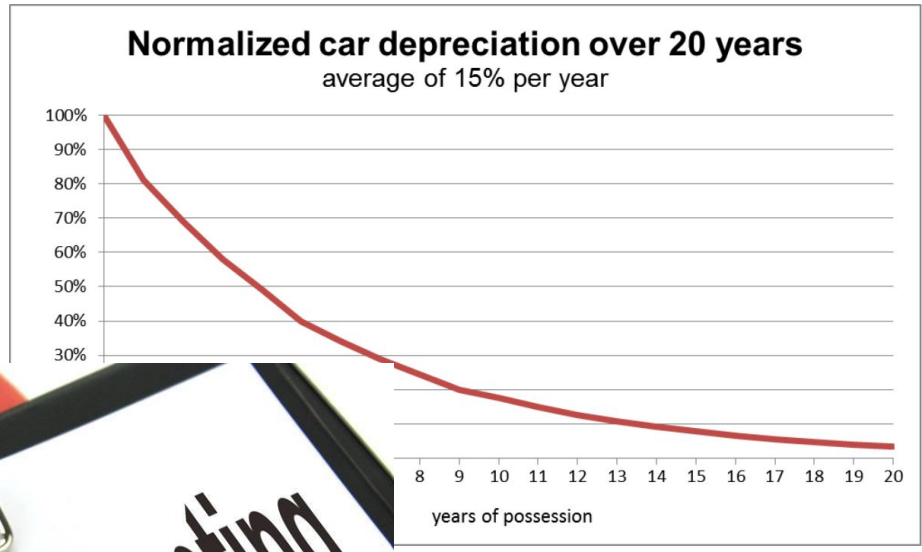
# Foundations of Entrepreneurship





## Depreciation and Amortization

**Manoj K Mondal**

**RMSoEE, IIT Kgaragpur**

- Depreciation definition
- Methods of depreciation
- Amortization
- Treatment of Capital Gain or Loss from Sale of Fixed Asset

# Depreciation

- Depreciation is an accounting method of gradual apportioning of the cost incurred to acquire a tangible asset as expense over its useful life.
- Businesses depreciate long-term assets differently for two different accounting purposes: i. for tax and ii. for reporting to stakeholders.

- Suppose you buy a Xerox machine for ₹1,00,000.
- You estimate that you can make 5,00,000 copies.
- Your tonner cost is ₹0.30p a piece.
- You pay total labor cost of ₹ 50,000.
- You feel that you can charge customers at 0.60p per copy.
- You want to estimate your cost and profit.
- Your total income out of the Xerox machine in its life of five years.

| | @ 0.60 per page | | @ 0.50 per page | |
|---|---|---|---|---|
| **Total income** | **5,00,000 X ₹0.60** | **₹ 3,00,000** | **₹ 5,00,000 X 0.50** | **₹ 2,50,000** |
| Toner cost | 5,00,000 X ₹0.20 | ₹ 1,00,000 | ₹ 5,00,000 X 0.20 | ₹ 1,00,000 |
| **Paper cost** | **5,00,000 X ₹0.10** | **₹ 50,000** | **₹ 5,00,000 X 0.10** | **₹ 50,000** |
| Labor cost | | ₹ 60,000 | | ₹ 60,000 |
| **Electricity cost** | | **₹ 6,000** | | **₹ 6,000** |
| Rent | | ₹ 24,000 | | ₹ 24,000 |
| **Maintenance** | | **₹ 10,000** | | **₹ 10,000** |
| Total cost | | ₹ 2,50,000 | | ₹ 2,50,000 |
| **Profit** | **3,00,000 – (1,50,000 + 50,000)** | **₹ 50,000** | | **0.00** |
| Suppose you want to sell the Xerox machine after the first year of operation. You may receive | | ₹ 70,000 | | ₹ 70,000 |
| Loss of value of the machine | | ₹ 30,000 | | ₹ 30,000 |
| Actual profit | | ₹ 20,000 | | (-) ₹ 30,000 |

# Depreciation is the process of charging the loss of value of capital assets in Profit & Loss A/C

- Through depreciation, the procurement costs of capital assets are gradually charged in the profit & loss account.
- The other alternative is to charge the entire cost of acquisition as expense in the year the expenditure is incurred.
- But that would cause great volatility in the bottom-line (profit), which is not desirable.

# Methods of Depreciation

- Straight-line method
- Declining balance method or declining/reducing value method
- Sum of years digits
- Units of production

# Straight-Line Method

- In 'Straight-Line Method' an asset is evenly depreciated over its useful life.
- Same amount of depreciation for a particular asset is allocated as expense each year of useful life.
- But, the asset will face some value at the end of assumed life. This is known as 'Salvage Value' or 'Terminal Value'
- Therefore, what you need to recover as depreciation is 'the cost of the machine' LESS the 'Salvage Value'.

# Straight-Line Method

**Depreciation = (Procurement cost – Salvage value)/Useful life**

**Procurement cost is the money paid to buy the asset.**

**Salvage value is the likely money to be recovered by selling the asset after the end of its useful life.**

**Suppose you buy an asset for ₹10,000 in 2016.**

**You make a fair assessment that the asset will last for five years.**

**You also assess that after five years, you are likely to sell the old asset at ₹ 2,000.**

**Here, the useful life is 5 years and salvage value is ₹ 2000**

**Annual depreciation = (10,000 – 2,000)/5 = 1600**

# Straight-Line Method … cont'd

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Book value as at the beginning of the year | 10000 | 8400 | 6800 | 5200 | 3600 |
| Depreciation | 1600 | 1600 | 1600 | 1600 | 1600 |
| Book value as at the end of the year | 8400 | 6800 | 5200 | 3600 | 2000 |

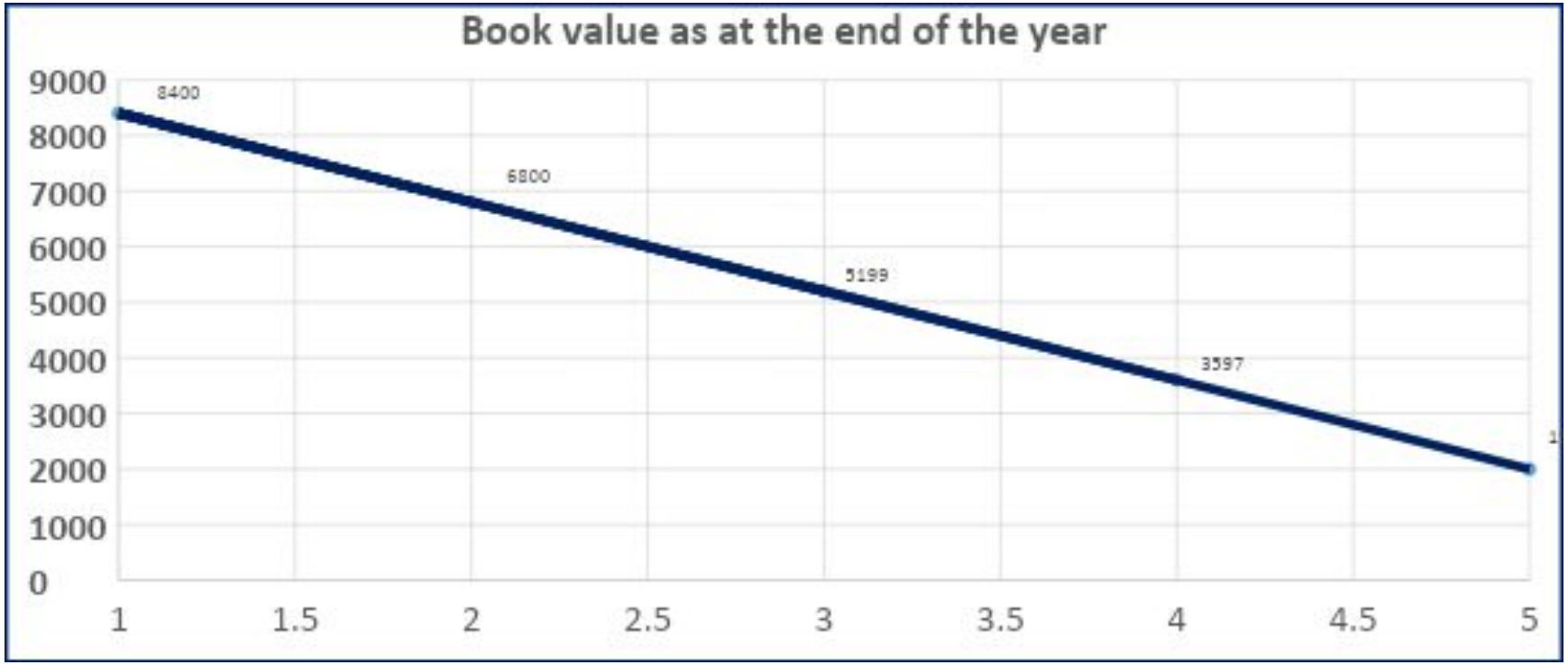
Notice that depreciation is the same in all the years of useful life

# Book Value

1. Get the initial cost of the fixed asset.
2. Subtract the estimated salvage value from the cost.
3. Estimate the useful life of the asset purely based on judgement.
4. Divide 2 by 3 to get annual equal depreciation.
5. Book value of an asset is the cost minus accumulated depreciation.
6. Book value at the time of purchase is the cost of the asset. At the end of one year, the book value is 10,000 – 1600 = 8,400, after 2 years it is 10,000 – 2X1600 = 6,800, and so on. Accumulated depreciation at the end of 2 years is 2X1600 = 3,200.

# Straight-Line Method

**Book value is also called the carrying amount of a fixed asset**



# Declining Balance Method or Reducing Value Method

- Also known as 'Written-down Value Method'
- Depreciation is charged at a fixed percentage on the book value of the asset every year.
- Procurement cost: ₹10,000. Depreciation rate = 20%
- Depreciation during year 1 = ₹10,000X20% = ₹2,000
- Book value of the asset at the end of year 1 = ₹10,000 – ₹2,000 = ₹8,000
- Depreciation in 2$^{nd}$ year = ₹8,000 X 20% = ₹1,600
- Book value at the end of 2$^{nd}$ year = ₹8,000 – ₹1,600 = ₹6,400

# Declining Balance Method

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Book value as at the beginning of the year | 10000 | 8000 | 6400 | 5120 | 4096 |
| Depreciation @20% | 2000 | 1600 | 1280 | 1024 | 819 |
| Book value as at the end of the year | 8000 | 6400 | 5120 | 4096 | 3277 |
| Accumulated depreciation | 2000 | 3600 | 4880 | 5904 | 6723 |

Book value is also referred to as 'Written-down value'

# Book Value

1. Get the initial cost of the fixed asset.
2. Decide on the percentage of depreciation to be used.
3. Estimate first year depreciation as the percentage to the cost of the asset.
4. Estimate the book value as at the end of the first year by subtracting depreciation from the cost.
5. Estimate the depreciation for the second year as the percentage of the book value as at the end of the fist year, and so on.
6. Notice the accumulated depreciation in the previous slide.

# Compare the Two Methods

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Book value as at the beginning of the year | 10000 | 8400 | 6800 | 5200 | 3600 |
| Depreciation | 1600 | 1600 | 1600 | 1600 | 1600 |
| Book value as at the end of the year | 8400 | 6800 | 5200 | 3600 | 2000 |

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Book value as at the beginning of the year | 10000 | 8000 | 6400 | 5120 | 4096 |
| Depreciation @20% | 2000 | 1600 | 1280 | 1024 | 819.2 |
| Book value as at the end of the year | 8000 | 6400 | 5120 | 4096 | 3277 |
| Accumulated depreciation | 2000 | 3600 | 4880 | 5904 | 6723 |

# The Distinctions Between the Two

| | | | |
|---|---|---|---|
| Straight-Line Method | Fixed AMOUNT of depreciation is allocated as expense every year | Have to determine useful life of the asset | Salvage is estimated and is deducted from the cost. |
| **Declining Balance Method** | Fixed PERCENTAGE of depreciation is allocated as expense each year. | The asset is considered to have perpetual life. | No salvage value concept. |

- The depreciation amount is recorded as expense in the Profit & Loss statement.
- The Value of the asset after depreciation is recorded in the Balance Sheet as the value of the asset and is the book value.
- Book value is also referred to as the Net Asset Value or simply Net Value of the asset.

| | |
|---|---|
| Gross profit (GP) | 255,000 |
| Operating expenses for our Trading Business | |
| Salary | 60,000 |
| Rent | 12,000 |
| Transportation | 5,000 |
| Telephone | 3,000 |
| Electricity | 6,000 |
| Trade license | 5,000 |
| Depreciation | 1,150 |
| Total operating expenses | 92,150 |
| Operating Profit (OP) | 162,850 |
| Interest | 0 |
| Profit Before Tax (PBT) | 162,850 |
| Income tax @0% | 48,855 |
| Net Profit | 113,995 |
| Dividend | 50,000 |
| Retained profit or earning | 63,995 |

Part of P&L Statement

Add them up

Subtract it from GP to get OP

**Balance sheet as on 31.03.2018**

| Assets | ? |
|---|---|
| Current assets/ Short-term assets | |
| Cash | 45,645 |
| Accounts receivable | 15,000 |
| Inventory | 10,000 |
| Fixed assets/ Long-term assets | |
| Furniture/Fixture (BV) | 1,350 |
| Machinery (Book Value) | 9,000 |
| Total Fixed Assets | 10,350 |
| Total of Assets: | 80,995 |
| Liabilities | |
| Current liabilities/ Short-term liabilities | |
| Accounts payable | 12000 |
| Short-term Bank loan | 0 |
| Long-term liabilities | |
| Long-term Bank loan | 0 |
| Other loan | 2000 |
| Owners' equity: | |
| Equity capital | 3000 |
| Retained profit/earnings | 63995 |
| Total of Liabilities and owners' equity | 80,995 |

Part of Balance Sheet Account

Purchased for 1500 minus depreciation of 150

Purchased for 10000 minus depreciation of 1000

Depreciation

# Amortization

- Amortization is analogous to depreciation.
- The difference is that
- depreciation is a method of gradual apportionment of the cost of acquisition of capital assets (fixed assets) and gradually charge the cost as expense in profit & loss account.

Whereas,

- Amortization is gradual spreading out of cost of acquisition or cost of creation of intangible assets such as R&D cost and brand building cost, some special types of revenue expenses (such as preliminary & preoperative expenses), and some long-term debts.

# Amortization

- Most common amortization:
- Advertisement expenses – though incurred in one year, the benefits are enjoyed for many years.
- Research & Development cost: the intellectual property emerging out of the R&D activity is enjoyed over a long period of time.
- Preliminary & Preoperative expenses: incurred at the early stage of a startup and is usually capitalized. It is amortized over a suitable period.
- Some licenses such as telecom, mining lease, bandwidth that are provided for a particular period for a onetime fee.
- From the perspective of useful period, these expenses has some appearance of capital assets.

# Depletion (of value)

- Used in case of natural resources
- For example coal and mines, petroleum blocks
- Telecom license: value gets depleted by the passage of time since the license is provided for a fixed period of time.

# Profit and Loss Statement for Certain Period

| |
|---|
| **1. Sales or Revenue** |
| 2. Minus ‘Cost of goods sold’ |
| 3. Opening stock plus Purchase during the year = Available stock. Minus ‘Closing stock’ = Cost of goods sold. |
| **4. Gross profit (1 –2)** |
| 5. Salaries |
| 6. Depreciation and amortization |
| 7. Other operational expenses |
| **8. Operating profit [4 – (sum of 5 through 7) ]** |
| 9. Interest or finance cost |
| **10. Profit before tax (8 – 9)** |
| 11. Income Tax. 12. Net profit = 10 – 11. 13. Dividend |
| 14. Retained profit transferred to Balance Sheet (12 – 13) |

# Owners' Capital

- Initial and subsequent investment made by the owners in the business.
- Part of the net profit generated by the business in each year that has been reinvested in the form of retained earnings or reserves & surplus.
- Funds raised through various rounds of investment by Business Angel and Venture Capitalists also form part of equity capital.

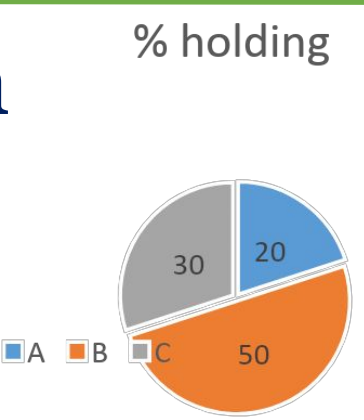
| Balance Sheet | |
|---|---|
| **Equity & Liabilities** | |
| **Equity capital** | |
| Authorized capital | 15,00,000 |
| Paid-up capital | 10,00,000 |
| Reserves & Surplus | 12,15,243 |
| Net worth | 22,15,243 |

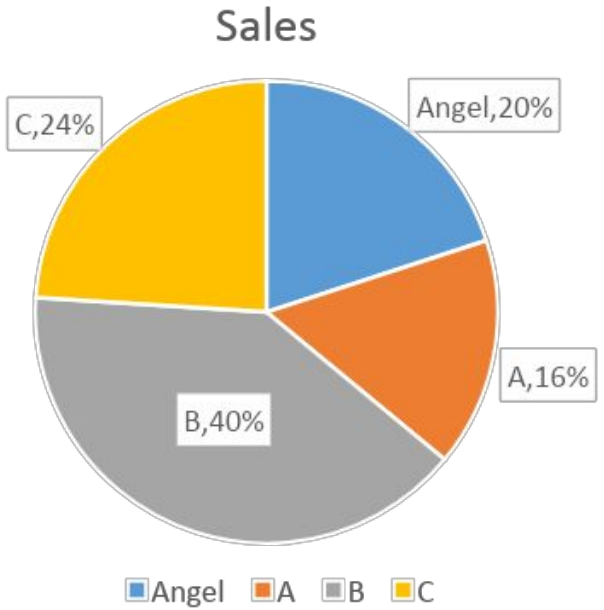
# Percentage Holding of Founders

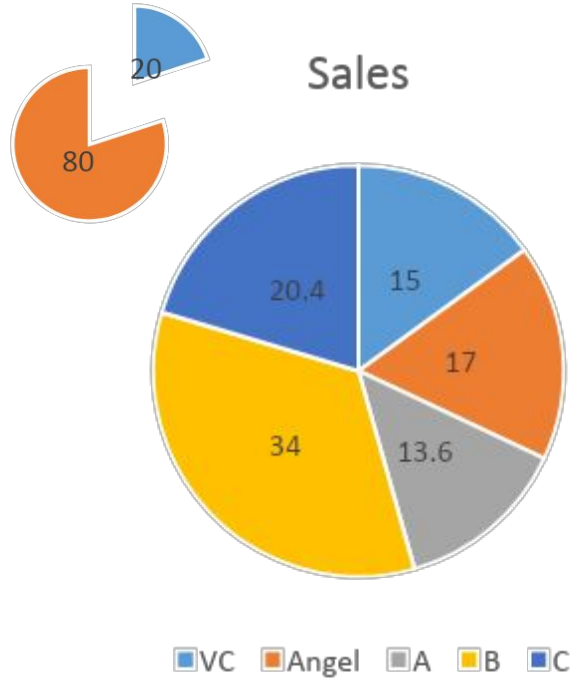
- Founders' holdings are the respective percentage of equity shares held by each.
- Say, equity of a startup is ₹10,00,000 divided into 1,00,000 shares of ₹10 each.
- Number of founders: 3 (let us call them A, B, & C)
- Share holding:
- A: 20,000; B: 50,000, & C: 30,000 shares.
- Holding of A is 20,000/1,00,000 = 20%
- Holding of B is 50,000/1,00,000 = 50%
- Holding of C is 30,000/1,00,000 = 30%

# You raise ₹1.00 crore from an investor in exchange for 20% of equity

- Now the equity distribution is as follows
- Investor: 20%
- Rest 80% is distributed among the founder in the proportion of their existing holding.
- A: 20%X0.8 = 16%
- B: 50%X0.8 = 40%
- C: 30%X0.8 = 24%



# Treatment of Capital Gain or Loss on Sale of Fixed Assets in Profit & Loss A/C

| Operational data for the year 2018-19 and some balance sheet data as on 31.3.2019 | |
|---|---|
| Payment of rent | 6,000 |
| Advertisement expense | 3,000 |
| Purchase of equipment | 12,000 |
| Salary | 36,000 |
| Closing stock | 15,400 |
| Transportation expense | 3,600 |
| Maintenance | 2,500 |
| Legal expense | 500 |
| Purchase of goods | 85,000 |
| Construction of factory shed | 300 |
| Purchase of truck | 2,500 |
| Truck hiring charge received | 300 |
| Amortization of Prelem. & preop. | 200 |
| Repayment of bank loan | 1,600 |
| Trade Receivables | 8,100 |
| Telephone bill payment | 350 |
| Purchase of telephone | 20 |
| Electricity bill payment | 1,250 |
| Sale of old machine (book value: **2400**) | 2,400 |

| Operational data for the year 2018-19 and some balance sheet data as on 31.3.2019 | |
|---|---|
| Payment of rent | 6,000 |
| Advertisement expense | 3,000 |
| Purchase of equipment | 12,000 |
| Salary | 36,000 |
| Closing stock | 15,400 |
| Transportation expense | 3,600 |
| Maintenance | 2,500 |
| Legal expense | 500 |
| Purchase of goods | 85,000 |
| Construction of factory shed | 300 |
| Purchase of truck | 2,500 |
| Truck hiring charge received | 300 |
| Amortization of Prelem. & preop. | 200 |
| Repayment of bank loan | 1,600 |
| Trade Receivables | 8,100 |
| Telephone bill payment | 350 |
| Purchase of telephone | 20 |
| Electricity bill payment | 1,250 |
| **Sale of old machine (book value: 2000)** | **2,400** |

**Profit & Loss Statement**

| | |
|---|---|
| Operating expenses | 52,857 |
| Operating profit (OP) | 13,343 |
| Operating profit margin (OP/Sales)X100 | 8.90% |
| **Add profit from sale of fixed assets** | **400** |
| Subtract Interest | 1,020 |
| **Add other income (Truck hiring charge)** | **300** |
| **Profit before tax** | 13,023 |

# Treatment of Capital Gain or Loss on Sale of Fixed Assets in Profit & Loss A/C

| Operational data for the year 2018-19 and some balance sheet data as on 31.3.2019 | |
|---|---|
| Payment of rent | 6,000 |
| Advertisement expense | 3,000 |
| Purchase of equipment | 12,000 |
| Salary | 36,000 |
| Closing stock | 15,400 |
| Transportation expense | 3,600 |
| Maintenance | 2,500 |
| Legal expense | 500 |
| Purchase of goods | 85,000 |
| Construction of factory shed | 300 |
| Purchase of truck | 2,500 |
| Truck hiring charge received | 300 |
| Amortization of Prelem. & preop. | 200 |
| Repayment of bank loan | 1,600 |
| Trade Receivables | 8,100 |
| Telephone bill payment | 350 |
| Purchase of telephone | 20 |
| Electricity bill payment | 1,250 |
| Sale of old machine (book value: **2400**) | 2,400 |

| Operational data for the year 2018-19 and some balance sheet data as on 31.3.2019 | |
|---|---|
| Payment of rent | 6,000 |
| Advertisement expense | 3,000 |
| Purchase of equipment | 12,000 |
| Salary | 36,000 |
| Closing stock | 15,400 |
| Transportation expense | 3,600 |
| Maintenance | 2,500 |
| Legal expense | 500 |
| Purchase of goods | 85,000 |
| Construction of factory shed | 300 |
| Purchase of truck | 2,500 |
| Truck hiring charge received | 300 |
| Amortization of Prelem. & preop. | 200 |
| Repayment of bank loan | 1,600 |
| Trade Receivables | 8,100 |
| Telephone bill payment | 350 |
| Purchase of telephone | 20 |
| Electricity bill payment | 1,250 |
| **Sale of old machine (book value: 2500)** | **2,400** |

**Profit & Loss Statement**

| | |
|---|---|
| Operating expenses | 52,857 |
| Operating profit (OP) | 13,343 |
| Operating profit margin (OP/Sales)X100 | 8.90% |
| **Subtract loss on sale of fixed assets** | **100** |
| Subtract Interest | 1,020 |
| **Add other income (Truck hiring charge)** | **300** |
| **Profit before tax** | 12,523 |

# Treatment in cash flow statement

| From operating activities | |
|---|---|
| Net profit | 8836.1 |
| Depreciation & amortization | 2157 |
| Change in inventory/ stock | -1200 |
| Change in accounts receivable | 1000 |
| Change in account payable | 957 |
| Add loss on sale of equipment | + |
| Subtract gain on sale of equipment | - |
| Sub total | 11750.1 |

| From investment activities | |
|---|---|
| Change in land | 0 |
| Change building | -300 |
| **Machinery** | **-14,520** |
| Sold machine | 2,400 |
| Sub total | -12,420 |

# Treatment of Capital Gain or Loss on Sale of Fixed Assets in Balance Sheet

| Non-current assets/ Fixed assets | 31.32018 | 31.3.2019 |
|---|---|---|
| Land | 500 | 500 |
| Building | 1000 | 1,235 |
| **Plant & Machinery** | **6800** | **17,028** |
| Preliminary & Preoperative exp. To the extent not amortized | 500 | 300 |
| Total non-current assets | 8800 | 19063 |
| Total assets | 34040 | 51,703 |

# Complete treatments

- **P&L A/C: only the difference is either added or subtracted**
- **Balance sheet: Book value is deducted**
- **Cash Flow statement:**
  - i. **Loss is added in 'Cash flow from operating activities'**
  - ii. **Profit is deducted from 'Cash flow from operating activities'**
  - iii. **The exact cash receipt is added in Cash Flow from investment activities**

# Business Model & Business Model Innovation (BMI)

- ***"A business model describes the rationale of how an organization creates, delivers, and captures value, in economic, social, cultural or other contexts. The process of business model construction and modification is also called business model innovation and forms a part of business strategy."*** **- Wikipedia**

# Business Model

- Business model is core aspect as to how a business creates and profitably delivers value to a group of satisfying customers.
- It is imperative that a business creates social, environmental, and cultural values for sustainability in the long run.
- Business model includes the purpose, vision, target customers, offerings, the value proposition, organizational structures, business process, infrastructure requirement, values and culture.

# Innovation

- Innovation is the process of turning new ideas and knowledge into value, in the form of new products, services, or ways of doing things.
- It is deceptively complex, and goes beyond mere creativity and invention to include the steps necessary for benefiting people.
- Very few innovations are groundbreaking. Majority are value addition to on earlier versions.
- Evidently, innovative firms significantly outperform others.
- Innovations fuel the majority of the world's long-term productivity and economic growth.

# Necessity Is the Mother of All Innovations

- If you are wondering which direction new technologies will emerge,
- Perhaps the best place to look at is the severest of pains the society is facing or likely to face in the immediate future.
- Pipping into research laboratories may not be much help.
- Go out and do something. You may encounter problems and start building solutions to that.
- Many entrepreneurs built solutions to problems they faced themselves. Phanindra Sama of redBus, Mahendra Pratap of Integra Micro Systems and many more.

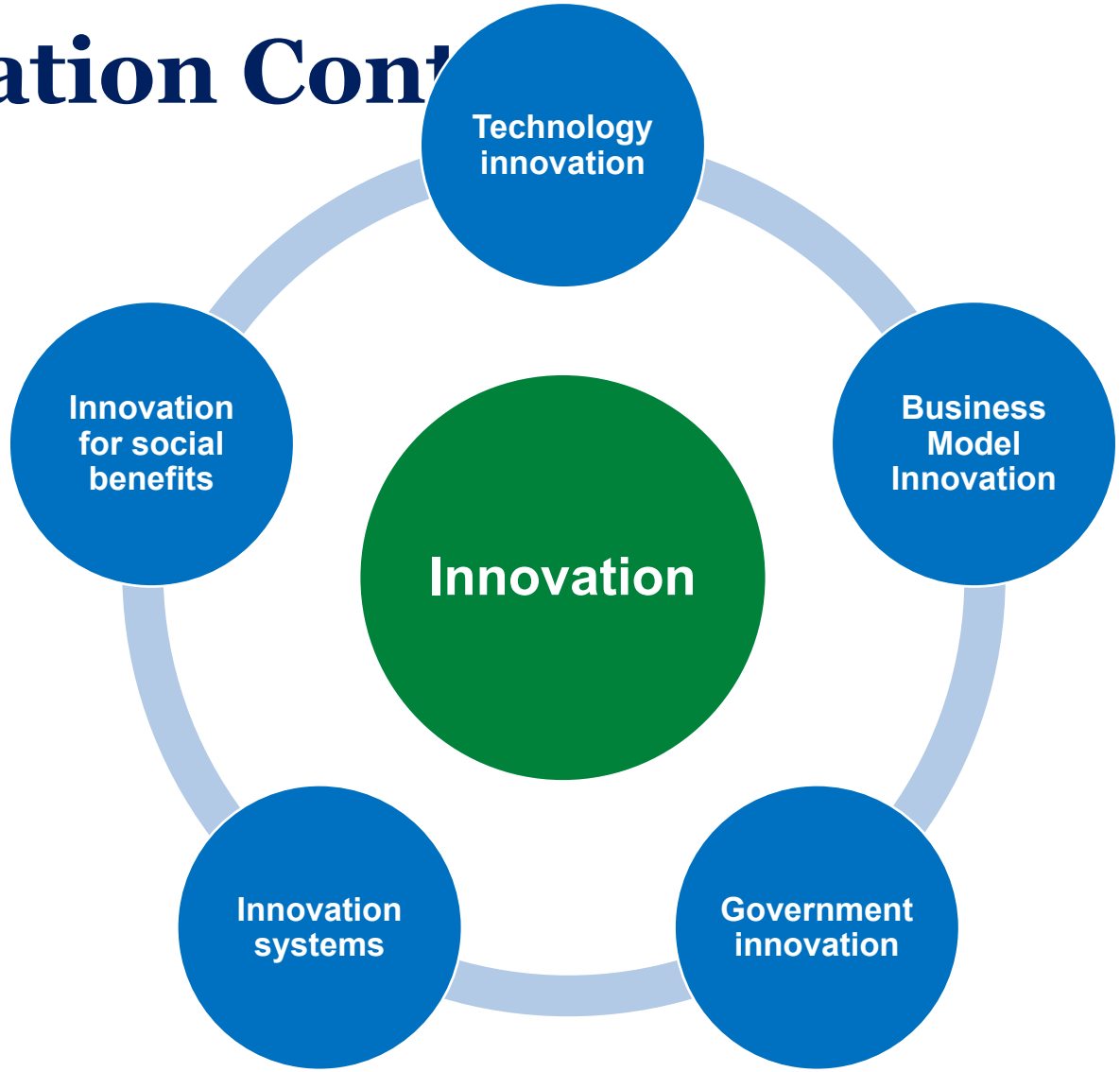
# Business Model Innovation (BMI)

- A business model is a business context explaining how an organization creates and delivers values in economic, social, cultural or other forms.
- The process of reconstruction of various aspects of the business for meeting changing market behaviour and delivering increasingly superior value to customers is *business model innovation*.
- Execution of the plan is an integral part of BMI and thus, management is inextricable part of BMI. Management innovation is a continuous process.

- **When the game gets tough, change the game.**

**- Belinda Anne Tamayo**

# Innovation Cont




**Source**
https://intelligence.weforum.org

# Technology Innovation – Emerging Areas

- Fourth industrial revolution
- Biotechnology
- 3D printing
- Virtual and augmented reality
- Artificial Intelligence & Robotics
- Human enhancement

- Advanced materials
- 5G
- Internet of things
- Autonomous transportation
- Digital communication
- Blockchain
- Quantum computing

# Business Model Innovation: Industrial Revolution - 4.0

- Disrupts status quo to provide better comforts to people or alleviate pain.
- The future of economic progress
- Shape corporate governance
- Next generation information technology
- Will promote new multinationals

# Is Technology Innovation Different from BMI?

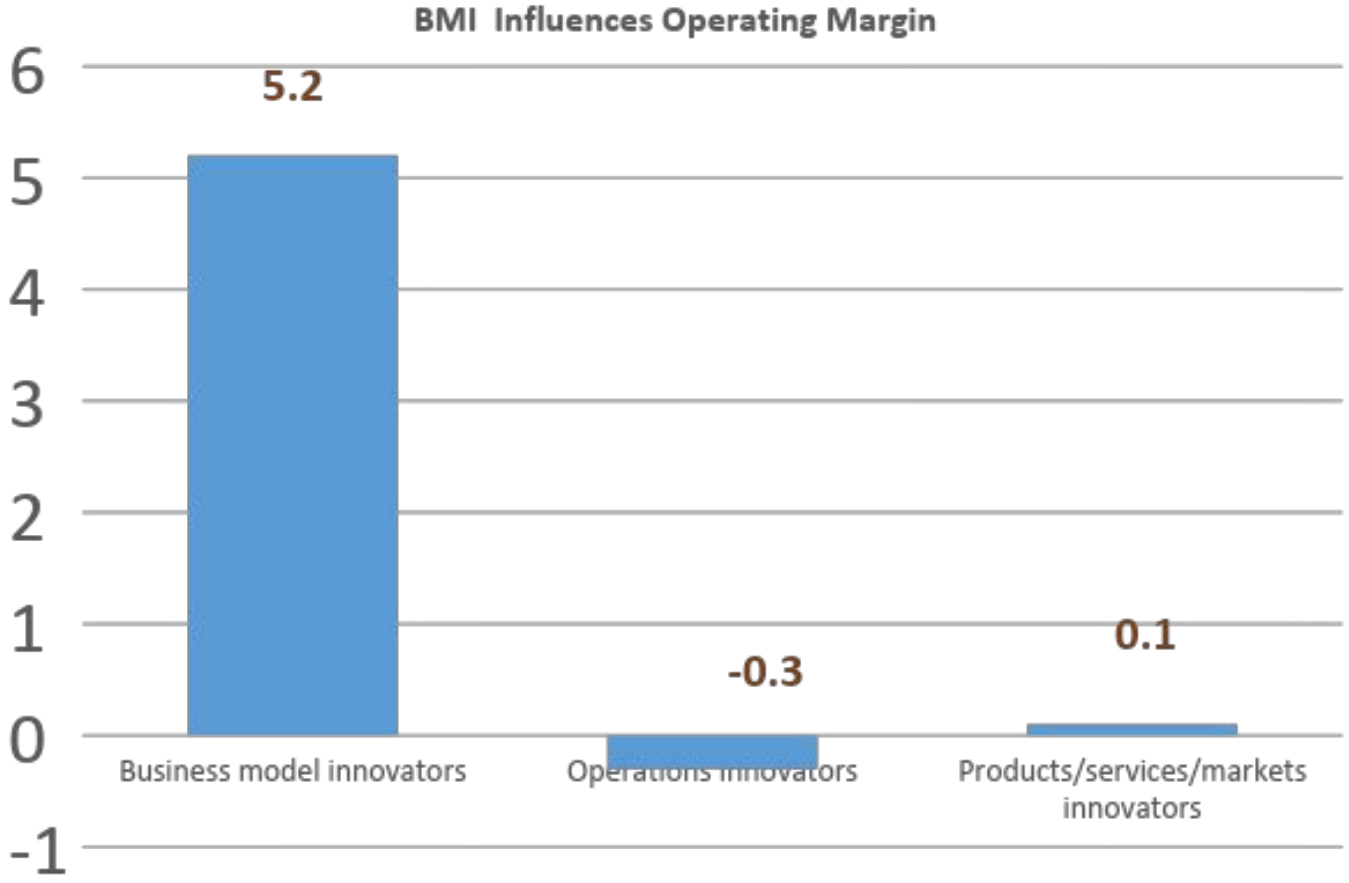
- All technology innovations are part of BMI
- Some BMIs are through technology innovation

# *"Get the business model wrong and there is no business"* – Prof. David Teece, University of California, Burckley

## The What, Why, How, and Whom of BMI

- What – What innovations are you executing?
- Why to innovate business model – will it create more value to your customers and bring advantages to your organization?
- How – how are you going to create and deliver economic, social, cultural and environmental values?
- For whom – Whose problems are you aiming alleviate?

# Business Model Innovators Outperform Competition in Terms of Operating Margin, Shareholders' Return



# Business Model Innovation is Possible in Several Forms

| | | | | |
|---|---|---|---|---|
| **Value Proposition** | **The product as service and outcome**<br>*General Electric*<br>*SaaS* | **The products as an experience**<br>*Apple – iPod*<br>*Candle with aroma* | **Trust premium**<br>*Whole Foods*<br>*TATA* | **Free (or nearly free)/ Freemium**<br>*Google*<br>*Gaana*<br>*Spotify* |
| **Operating Model** | **Deconstruction**<br>*Li & Fung Ltd.*<br>*Adani* | **Integration/ acceleration of the supply chain**<br>*Zara*<br>*Reliance* | **Low cost**<br>*Aravind*<br>*Tata Motors* | **Direct distribution**<br>*Google*<br>*CCD*<br>*Nestle Nespresso* |
| **Business System Architecture** | **Open**<br>*Facebook* | **Person to person**<br>*PayPal*<br>*PayTM* | **Adjacency**<br>*Ikea's Mega Mall Division* | **Serial**<br>*Virgin Group* |

Recreated from BCG Research

- Financial Accounting: A Managerial Perspective by R. Narayanaswamy
- Tulsian's Principles and Practice of Accounting for CA Foundation Course with Quick Revision Book
- by P. C. Tulsian, Bharat Tulsian
- Financial Management for CA Intermediate by V. Rajesh Kumar

Some references unrelated to the above topic

- http://benbarry.com/project/facebooks-little-red-book
- Stel A. v, M. Carree and R. Thurik (2005), ***The effect of entrepreneurial activity on national economic growth***, Small Business Economics, Vol. 24, No. 3, pp. 311-321
- Praag C. M. Van, and P. H. Versloot (2007), ***What is the value of entrepreneurship? A review of recent research,*** Small Business Economics, Vol. 29, pp. 351–382
- Rajiv Shah, Zhijie Gao, Harini Mittal (2015) **Innovation, Entrepreneurship, and the Economy in the US, China, and India** – Elsevier
- Sean Ammirati (2016) **The Science of Growth: How Facebook Beat Friendster—And How Nine Other Startups Left the Rest in the Dust**, St. Martin's Press.

# Good Video Lectures and Reading Materials

- **http://startupclass.samaltman.com/**
- **http://darwine.nl/weblog/files/Stanford-How_to_ Start_a_Startup.pdf**

- Straight-line method is the default method of depreciation.
- Depreciation is non-cash expense.
- Depreciation and amortization is mere book entries to charge these costs in the profit & loss account.

# Thank you