Business Analytics Project Using Power BI

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Evaluation of financial reports is an essential tool that organizations can utilize to assess their financial health. Profitability and risk analysis would enable the organization to plan out their future and determine necessary actions that should be taken in order to remain competitive.

Through evaluating the data on the organization's products, we can deduce Armadillo generated the highest level of gross sales and net profits. It is also essential to look at how much gross profit turned to net profit to determine product profitability. Figure 1, DB1 shows that Armadillo has the highest net profit of $1.7M, with the most profitability in Alberta. While both Gecko and Chameleon didn't produce as high of a net profit compared to Armadillo ($1.3M and $776K respectively), more net sales were converted to net profit in comparison to the other products as shown in Figure 3, DB1, demonstrating a net profit margin of 56% and 35% respectively. The high profitability of both Gecko and Chameleon can be characterized by their low average manufacturing cost as shown in Figure 5, DB1. In contrast, the least profitable product is Viper, with net loss of $185K (Figure 3, DB1) and lowest net profit margin of -1%. We can see the financial weakness of Viper in Figure 1 as it has negative net profit in every province.

Figure 1, DB2 further displays that Alberta is the most profitable province with a net profit of $1.33M, despite the very similar gross profit as the other provinces (Figure 2, DB2). British Columbia has the lowest net profit of only 0.56M. The product BOA has the highest gross and net sales (Figure 2 and Figure 3, DB1), yet it has third lowest net profit (Figure 3, DB1). This is contributed by BOA's very poor financial performance in British Columbia, where it had a net loss of $125K (Figure 1, DB1). Based on this, the organization should increase their market in Alberta to increase the organizations profitability and the market strategy for BOA in British Columbia should be reviewed.

Government segment has a high profitability, as it has a high average gross and net profit margin of 29% and 14% respectively (Figure 5, DB2). This can be characterized by the fact that both Gecko and Chameleon were sold the most in this segment (Figure 4, DB1) and as previous stated, Gecko and Chameleon were two most profitable products. Small Business segment has the lowest average gross profit and net profit margin. Shown in Figure 3, DB2, each product either has a negative net profit or a very low net profit in Small Business, with BOA having the most negative net profit. Viper has negative

net profit in each segment except in Enterprise (Figure 3, DB2). To increase profitability, the organization should increase sales in the Enterprise and Government segment and review sale strategies in the Small Business segment, especially for BOA and Viper products.

In Figure 4, DB3, the contribution margin ratio per product was calculated. As indicated in this figure Gecko has the highest contribution margin, while Viper has the lowest. As previously mentioned, Viper has the lowest profitability. For Viper, the company should either increase the price or reduce the variable costs associated with the production. When assessing a company's risk, it is important to consider the margin of safety (MOS) which indicates the point at which that specific product generates a profit. Viper has a MOS of –9.50 and Python also has a relatively low MOS, which means there is a greater risk associated with selling this product (Figure 3, DB3). As the MOS is negative, the company is experiencing a loss when selling both products. In comparison, Gecko and Chameleon have a high MOS at 0.87 and 0.76 respectively. A high MOS indicates that the business has a low risk of experiencing a loss from this product.

Chameleon and Gecko have the lowest degree of operating leverage (DOL) with values of 1.35 and 1.16 respectively (Figure 3, DB3), indicating these products have a low business risk. Both Chameleon and Gecko have low amount of fixed and variable costs as shown in Figure 5, DB1. Despite Armadillo having the highest net profit which contributes to the organization's healthy financial performance, its DOL is 5.38. Armadillo incurs the second most amount of fixed and variable costs (Table 1, Exhibit 1), but due to its high sales, it does not pose a high business risk. Viper's DOL is –20.98, which implies a higher degree of sensitivity to changes in sales and as a result pose a higher business risk. Therefore, more sales are required to cover fixed costs, so the organization should either decrease fixed costs or as mentioned previously, terminate Viper sales.

In conclusion, after analyzing the products by both segment and province, Viper was determined to have both the lowest profitability and highest product risk. It is advised that the company stop the production of Viper and put the resources towards more profitable products such as Chameleon or Gecko to increase the overall profitability of the company in the following fiscal year.

Dashboard 1: Profitability analysis by Product

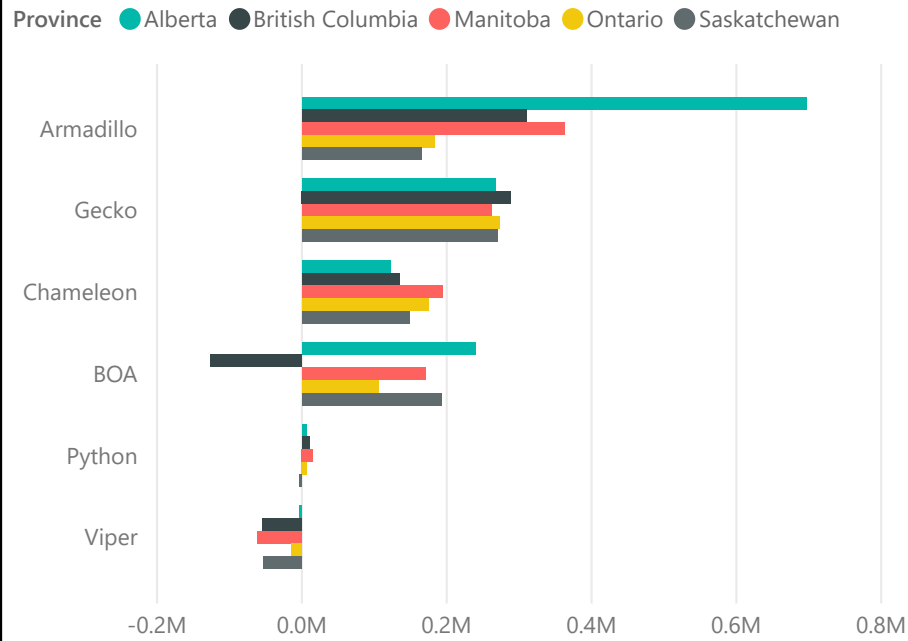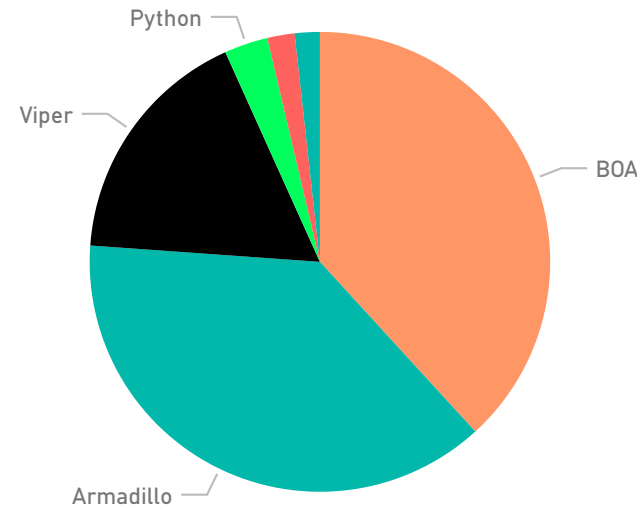## Figure 1 Net Profit by Product and Province

Province ● Alberta ● British Columbia ● Manitoba ● Ontario ● Saskatchewan

Products (top to bottom): Armadillo, Gecko, Chameleon, BOA, Python, Viper

X-axis: -0.2M, 0.0M, 0.2M, 0.4M, 0.6M, 0.8M

Figure 2: Gross Sales by Product

Python
Viper
BOA
Armadillo

Figure 3: Net Profit and Net Sale by Product

● Net Sales ● Net Profit

Y-axis left: 0M, 10M, 20M, 30M, 40M, 50M
Y-axis right: -0.5M, 0.0M, 0.5M, 1.0M, 1.5M, 2.0M

Product	Net Sales	Net Profit
BOA	49M	0.58M
Armadillo	48M	1.72M
Viper	22M	-0.19M
Python	4M	0.04M
Gecko	2M	1.36M
Chameleon	2M	0.78M
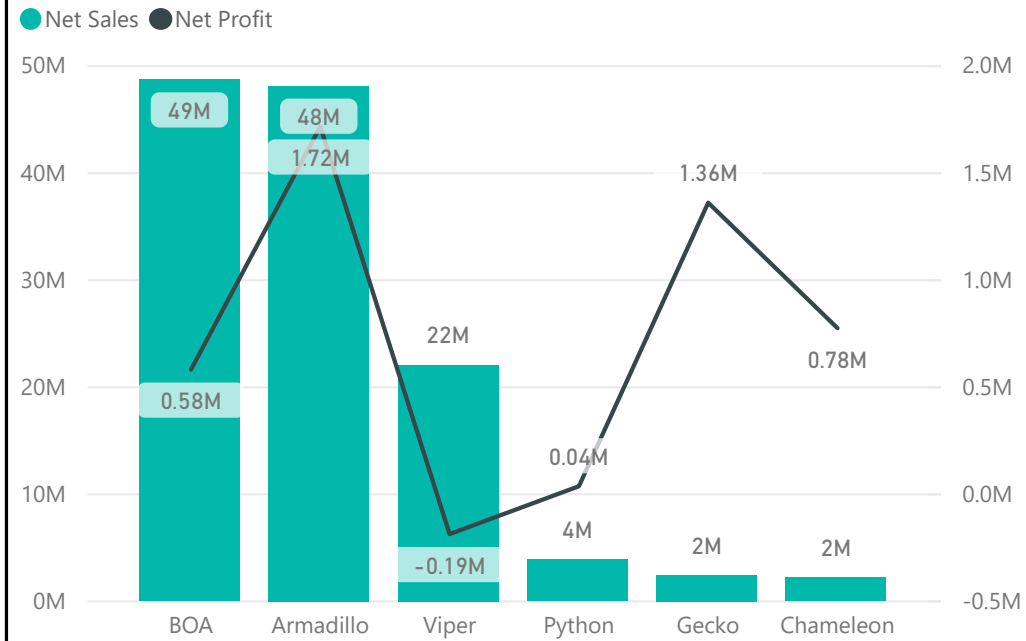
Figure 4: Units Sold by Segment and Product

Product ● Armadillo ● BOA ● Chameleon ● Gecko ● Python ● Viper

Y-axis: 0K, 50K, 100K, 150K

Segments: Government, Midmarket, Enterprise, Channel Partners, Small Business
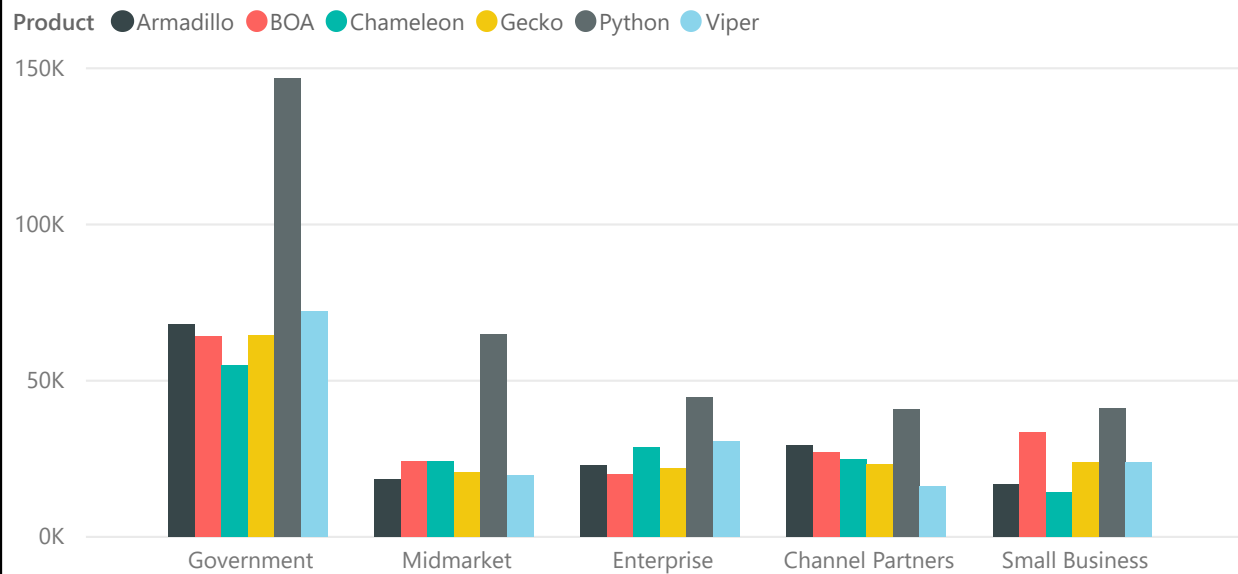
Figure 5: Average Manufacturing Cost by Product

● Average of Direct Labour ● Average of Direct Materials ● Average of Var Overhead ● Average of Fixed Overhead

Y-axis: 0, 50, 100

Products: BOA, Armadillo, Viper, Python, Chameleon, Gecko
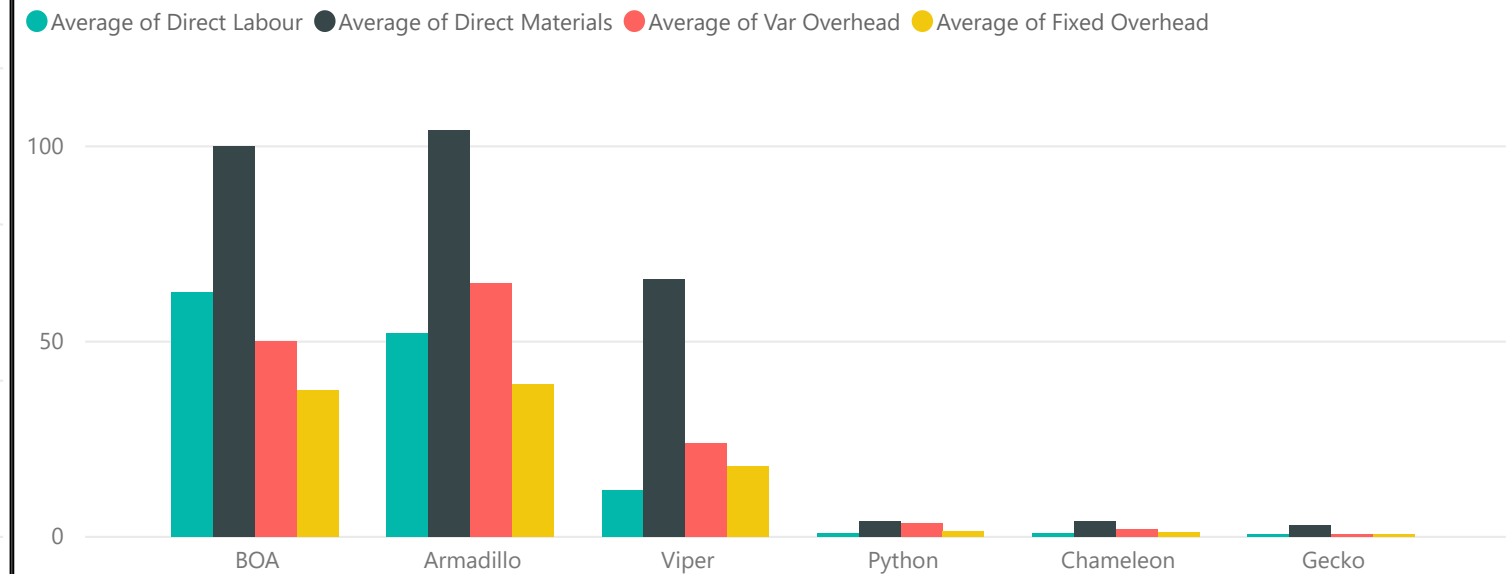
Dashboard 2: Profitability analysis by Segment and Province

Figure 1: Net Profit by Province

100%

Province	Net Profit
Alberta	1.33M
Manitoba	0.94M
Ontario	0.73M
Saskatchewan	0.72M
British Columbia	0.56M

42.5%
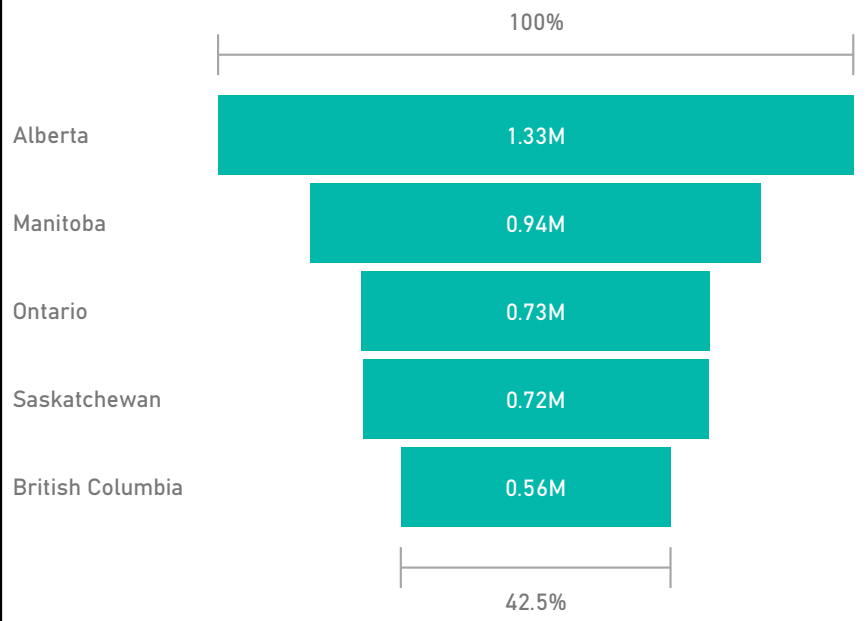
Figure 2: Gross Profits by Province

Manitoba	Ontario	British Columbia
4.37M		
Alberta	4.14M	3.83M
	Saskatchewan	
4.37M	3.52M	
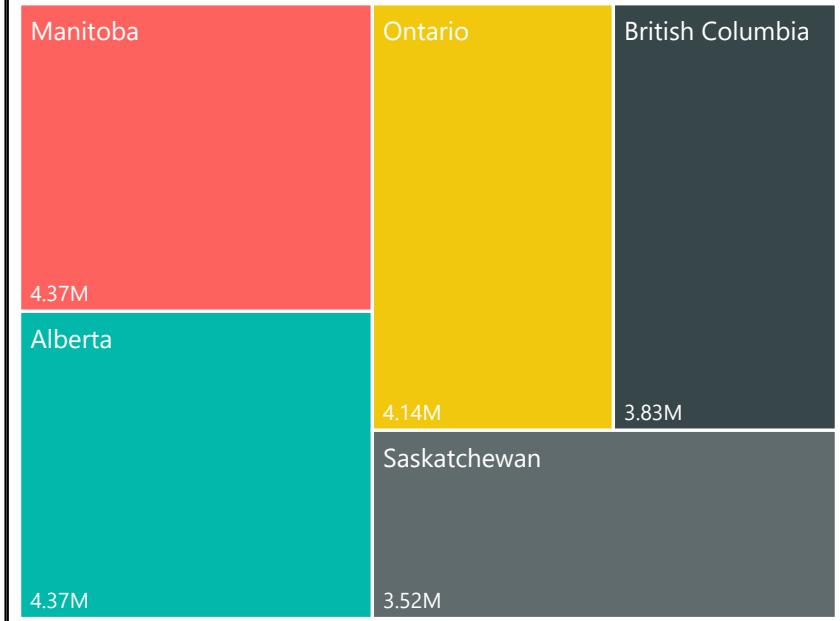
Figure 3: Net Profit by Product and Segment

Segment ● Channel Partners ● Enterprise ● Government ● Midmarket ● Small Business

Armadillo, Gecko, Chameleon, BOA, Python, Viper

-0.5M   0.0M   0.5M   1.0M   1.5M
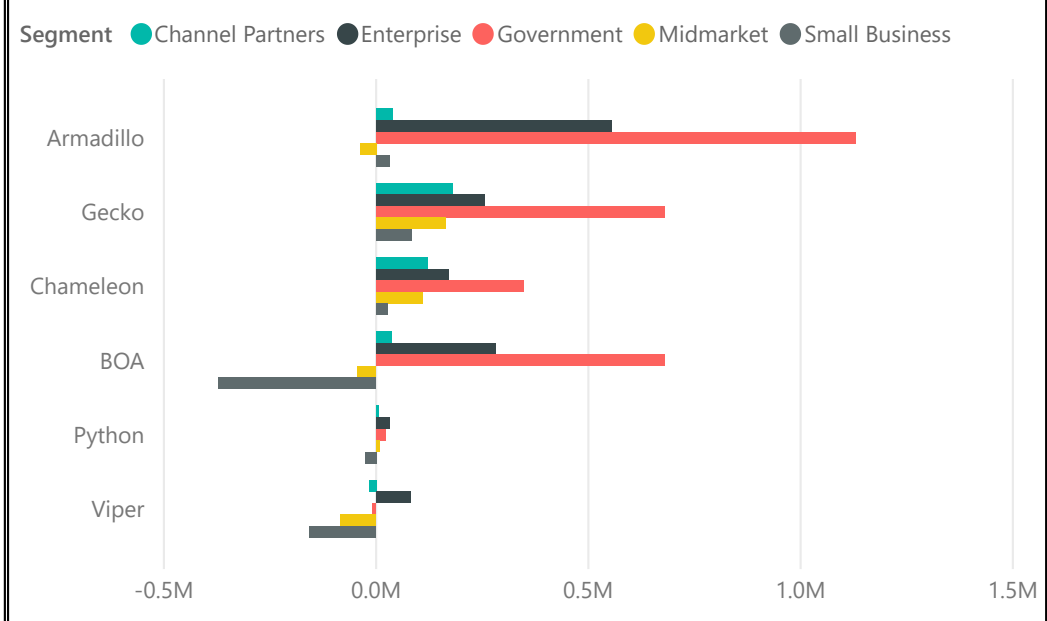
Figure 4: Gross Sales by Segment

60M, 50M, 40M, 30M, 20M, 10M

Government	Channel Partners	Enterprise	Small Business	Midmarket
60M	21M	21M	18M	17M
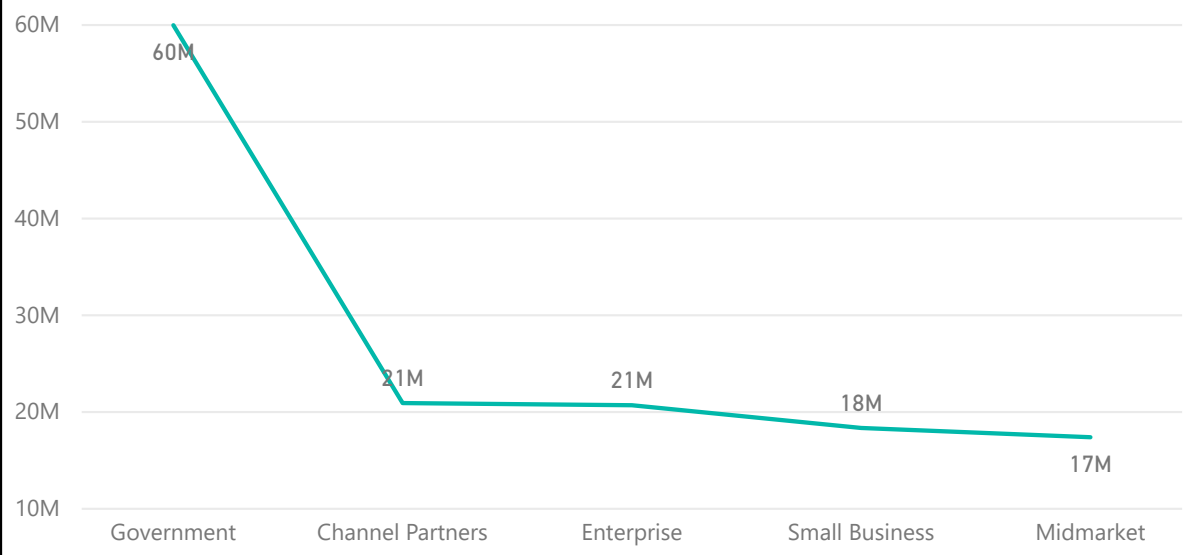
Figure 5: Average of Gross Profit Margin and Average of Net Profit Margin by Segment

● Average of Gross Profit Margin ● Average of Net Profit Margin

0.3, 0.2, 0.1, 0.0

Segment	Gross Profit Margin	Net Profit Margin
Enterprise	0.29	0.16
Government	0.29	0.14
Channel Partners	0.22	0.12
Midmarket	0.20	0.10
Small Business	0.14	0.04
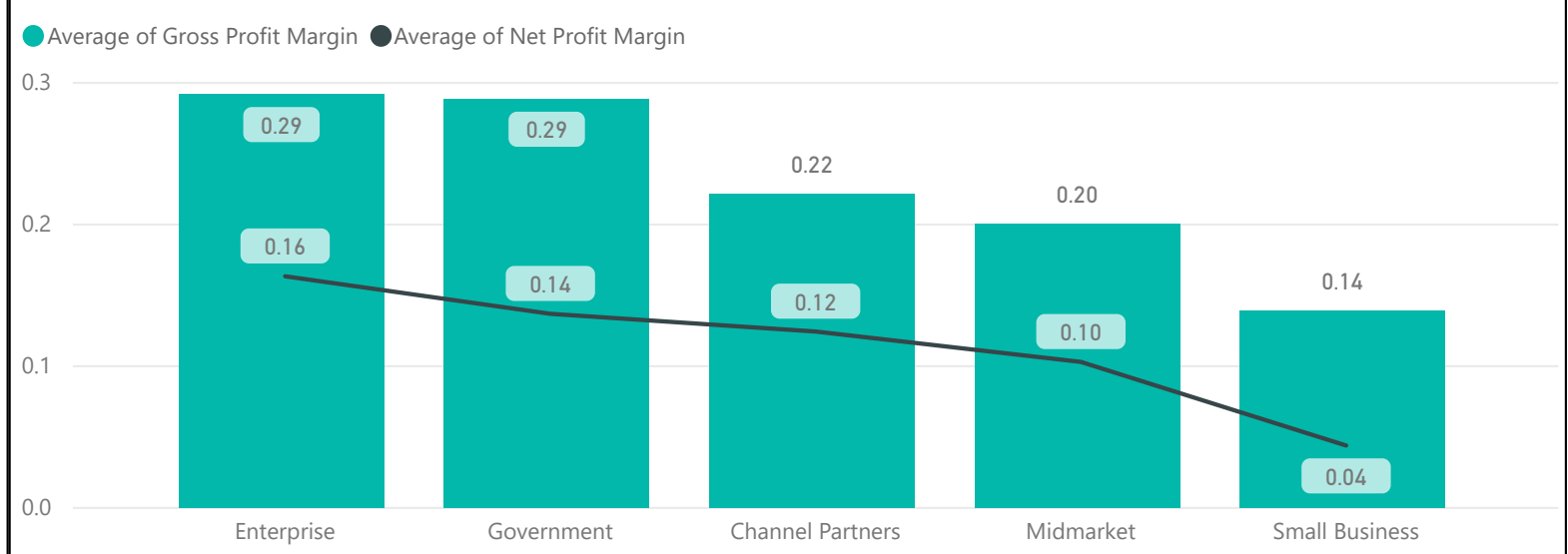
Dashboard 3: Risk Analysis

Product
- Armadillo
- BOA
- Chameleon
- Gecko
- Python
- Viper

Year
- ☐ 2017
- ■ 2018

Figure 1

What is the total 2018 actual gross sale?

$105M

2018 Actual Gross Sales

Figure 2

What is the total 2018 expected gross sale?

$90.8M

2018 Expected Gross Sales

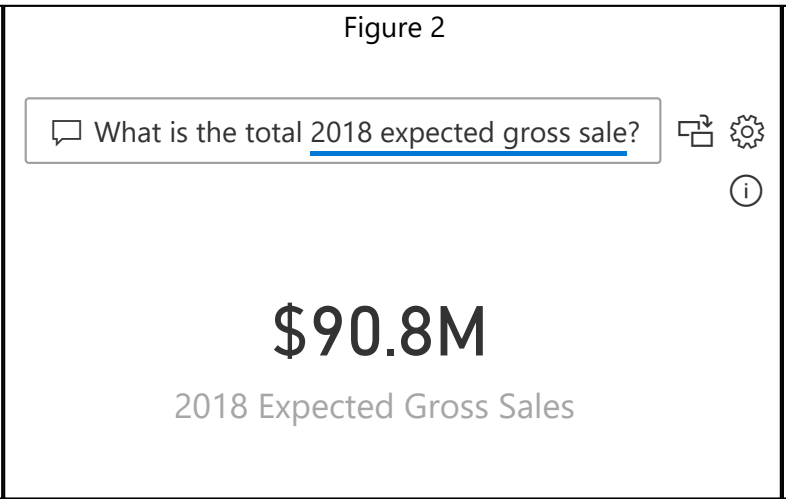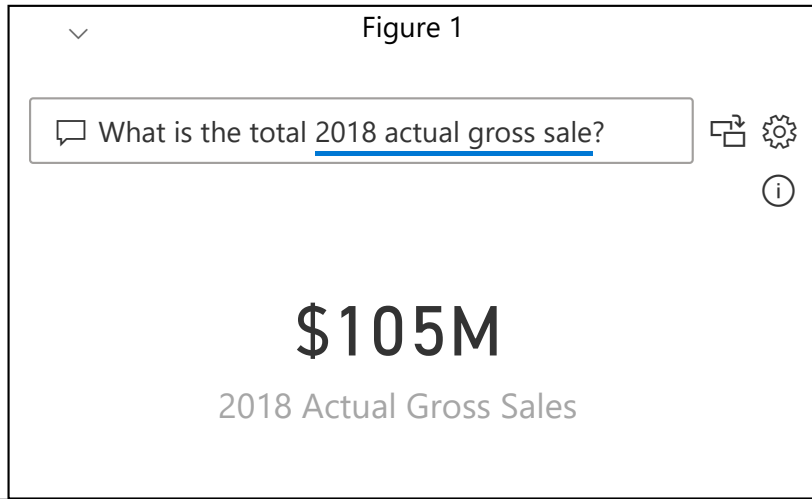## Figure 3: Degree of Operating Leverage and Margin of Safety by Product

Product	Degree of Op. Lev.	Margin of Safety
Python	21.77	-0.04
BOA	13.52	0.08
Armadillo	5.38	0.23
Chameleon	1.35	0.76
Gecko	1.16	0.87
Viper	-20.98	-9.50

Figure 4 Average of Contribution Margin by Product

100%

Gecko	65%
Chameleon	47%
Armadillo	21%
BOA	19%
Python	18%
Viper	17%

25.8%

Figure 5 2018 Actual Gross Sales vs Expected Gross Sales by Product

● 2018 Actual Gross Sales ● 2018 Expected Gross Sales

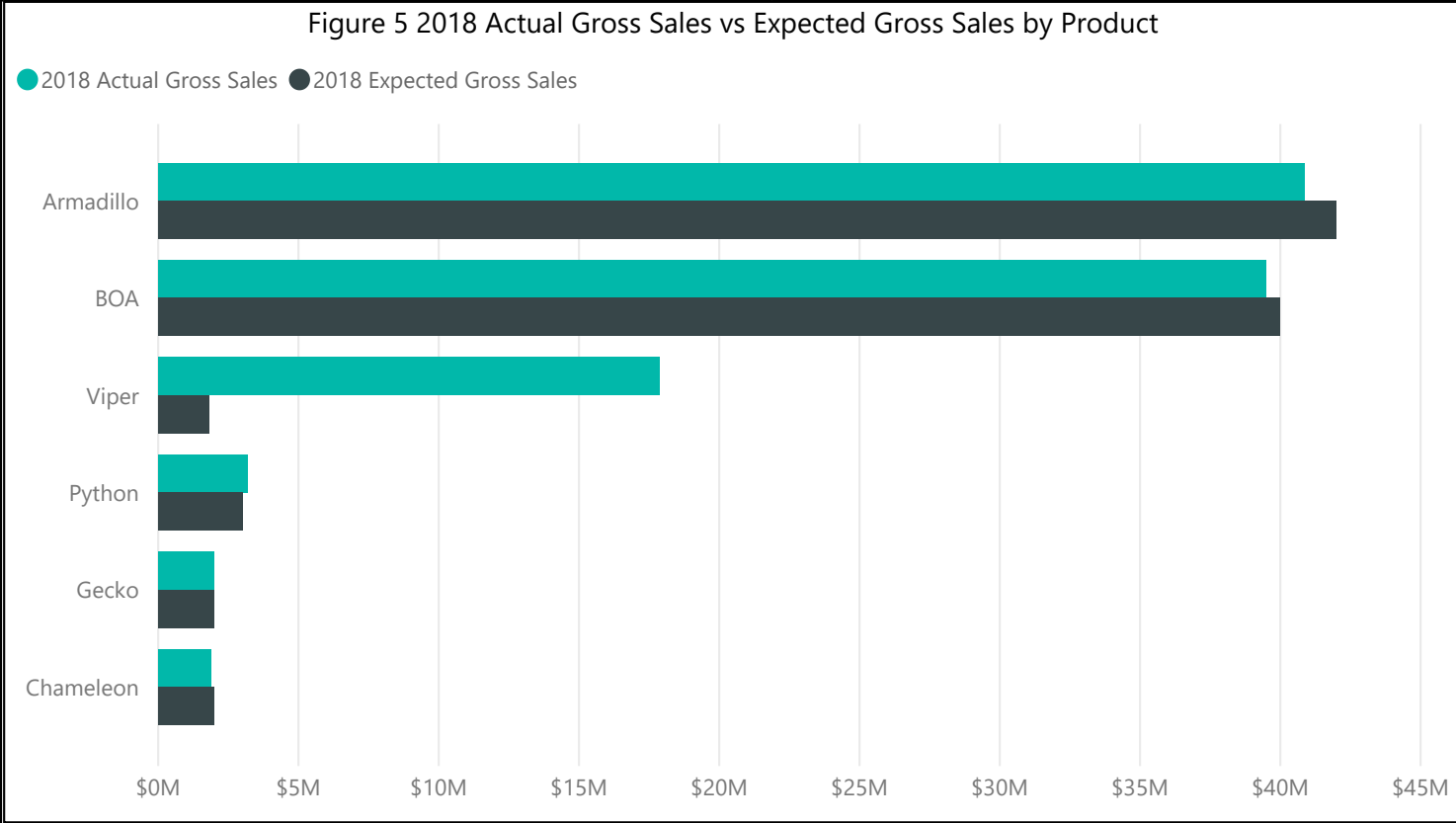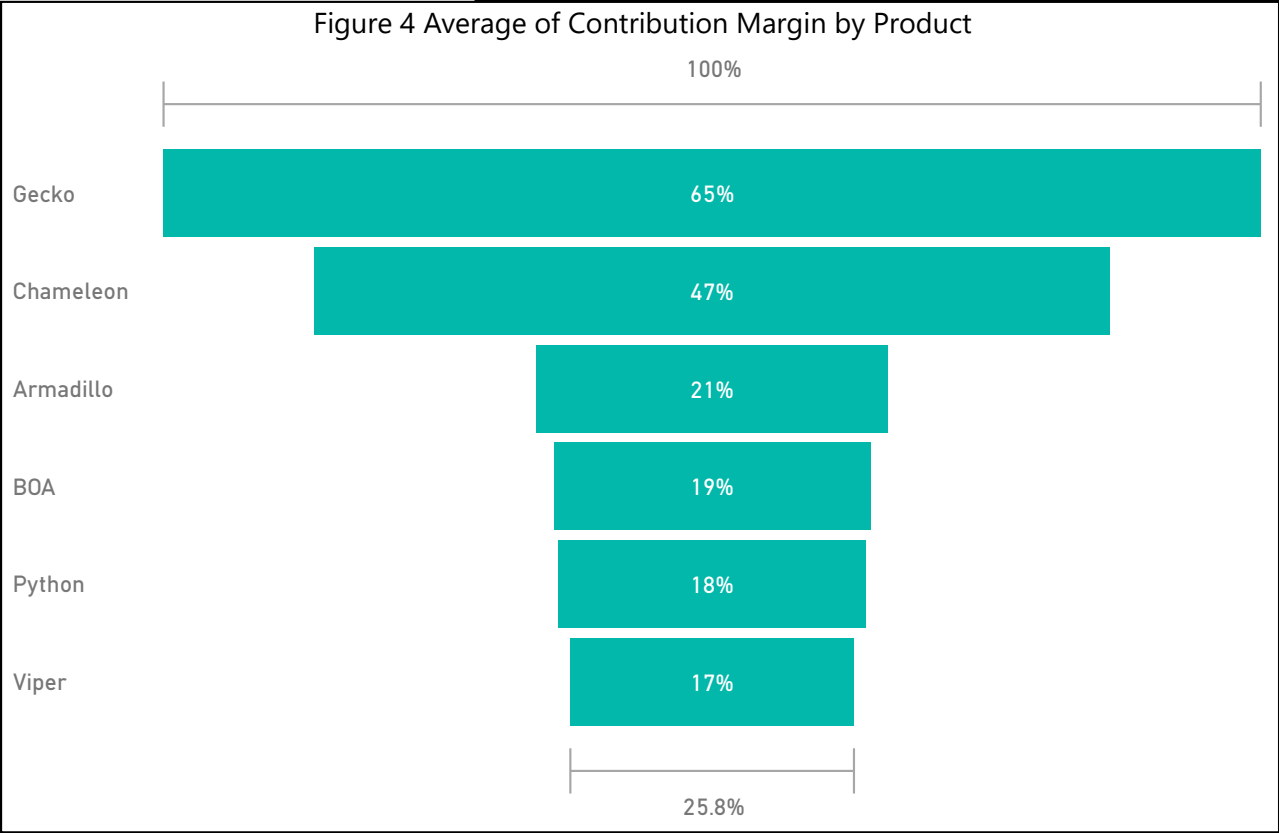$0M $5M $10M $15M $20M $25M $30M $35M $40M $45M

Exhibit 1:

Table 1: Quantitative Data for Analysis

Product	2018 Expected Sale	2018 Actual Gross Sale	2-Year Gross Sales	2 Year Net Sale	2 Year Gross Profit	2- Year NP	Total Net Sale 2018	Total variable cost 2018	Total fixed cost 2018	2018 CM	2018 BE Sales
Armadillo	$42,000,000	$40,851,235	$52,091,865	$48,170,741	$7,788,841	$1,717,979	$37,882,104	$30,049,702	$6,377,502	$7,832,402	$32,487,771
BOA	$40,000,000	$39,485,475	$52,488,995	$48,757,822	$6,562,072	$582,477	$36,760,145	$29,903,471	$6,349,382	$6,856,673	$36,864,137
Python	$3,000,000	$3,183,898.5	$4,209,183	$3,911,872	$529,477	$37,845	$2,957,792	$2,421,825	$511,345	$535,967	$3,115,417
Chameleon	$2,000,000	$1,871,763	$2,410,335	$2,232,696	$1,057,928	$776,159	$1,741,320	$925,767	$213,401	$815,552	$470,256
Gecko	$2,000,000	$1,974,105	$2,632,475	$2,447,925	$1,676,935	$1,362,126	$1,840,495	$651,718	$167,403	$1,188,777	$264,614
Viper	$1,800,000	$17,863,240	$23,533,040	$22,102,024	$2,611,084	($185,591)	$16,737,613	$13,943,148	$2,927,693	$2,794,465	$18,894,520
Total	**$90,800,000**	**$105,229,716.5**	**$137,365,893**	**$127,623,081**	**$20,226,338**	**$4,290,996**	**$97,919,468**	**$77,895,631**	**$16,546,725**	**$20,023,837**	**$92,096,713**

Table 2: Financial Ratio for Analysis

Product	2018 CMR	Margin of Safety	Degree of Op. Lev.	Gross Profit Margin	Net Profit Margin
Armadillo	21%	0.23	5.38	16%	4%
BOA	19%	0.08	13.52	13%	1%
Chameleon	47%	0.76	1.35	47%	35%
Gecko	65%	0.87	1.16	69%	56%
Python	18%	-0.04	21.77	14%	1%
Viper	17%	-9.50	-20.98	12%	-1%

Legend:
NP= Net Profit

CM= Contribution Margin

CMR= Contribution Margin Ratio

BE Sales= Break-even Sales

Degree of Op. Lev = Degree of Operating Leverage

Formula used for Ratio Calculation:
2018 CMR = 2018 CM / Total Net Sale 2018

Margin of Safety = (2018 Expected Sale - 2018 BE Sales) / 2018 Expected Sale

Degree of Op. Lev= (2018 CM - Total fixed cost 2018) / 2018 CM

Gross Profit Margin = 2 Year Gross Profit ./ 2 Year Net Sale

Net Profit Margin = 2 Year NP / 2 Year Net Sale

* Please refer to the uploaded Excel sheet for more formula used in the quantitative data for analysis.

**$1,800.000 was used for the 2018 Expected Sales of Viper rather than $18,000,000.