In [5]:
```
import pandas as pd

# Load the dataset
df = pd.read_csv("Monthly_Financial_Report_2024.csv")
df
```

Out[5]:

	Month	Department	Revenue_NGN	Expenses_NGN	Category	Profit_NGN	Profit_Margin_%
0	Jan-2024	Sales	3719110	1371155	Core Operations	2347955	63.132174
1	Jan-2024	Operations	3729084	2114414	Core Operations	1614670	43.299373
2	Jan-2024	Admin	0	959178	Support Services	-959178	0.000000
3	Jan-2024	Finance	0	2392743	Support Services	-2392743	0.000000
4	Jan-2024	IT	0	810268	Support Services	-810268	0.000000
5	Feb-2024	Sales	2232180	1803462	Core Operations	428718	19.206247
6	Feb-2024	Operations	3734489	1699890	Core Operations	2034599	54.481323
7	Feb-2024	Admin	0	2270006	Support Services	-2270006	0.000000
8	Feb-2024	Finance	0	1836074	Support Services	-1836074	0.000000
9	Feb-2024	IT	0	1612756	Support Services	-1612756	0.000000
10	Mar-2024	Sales	3772355	1939911	Core Operations	1832444	48.575598
11	Mar-2024	Operations	1778167	741090	Core Operations	1037077	58.322812
12	Mar-2024	Admin	0	1029365	Support Services	-1029365	0.000000
13	Mar-2024	Finance	0	1813396	Support Services	-1813396	0.000000
14	Mar-2024	IT	0	1487201	Support Services	-1487201	0.000000
15	Apr-2024	Sales	2870455	2466891	Core Operations	403564	14.059235
16	Apr-2024	Operations	1827069	1947617	Core Operations	-120548	-6.597890
17	Apr-2024	Admin	0	1491743	Support Services	-1491743	0.000000
18	Apr-2024	Finance	0	803355	Support Services	-803355	0.000000
19	Apr-2024	IT	0	1984372	Support Services	-1984372	0.000000
20	May-2024	Sales	2762752	884779	Core Operations	1877973	67.974722
21	May-2024	Operations	2896025	2170485	Core Operations	725540	25.052961

	Month	Department	Revenue_NGN	Expenses_NGN	Category	Profit_NGN	Profit_Margin_%
22	May-2024	Admin	0	1689436	Support Services	-1689436	0.000000
23	May-2024	Finance	0	2007371	Support Services	-2007371	0.000000
24	May-2024	IT	0	1186232	Support Services	-1186232	0.000000
25	Jun-2024	Sales	2417040	2248762	Core Operations	168278	6.962152
26	Jun-2024	Operations	3753882	2133257	Core Operations	1620625	43.171975
27	Jun-2024	Admin	0	1898079	Support Services	-1898079	0.000000
28	Jun-2024	Finance	0	1354811	Support Services	-1354811	0.000000
29	Jun-2024	IT	0	1227035	Support Services	-1227035	0.000000
30	Jul-2024	Sales	2148143	2200942	Core Operations	-52799	-2.457890
31	Jul-2024	Operations	1565725	1878557	Core Operations	-312832	-19.980009
32	Jul-2024	Admin	0	784654	Support Services	-784654	0.000000
33	Jul-2024	Finance	0	1653277	Support Services	-1653277	0.000000
34	Jul-2024	IT	0	1291723	Support Services	-1291723	0.000000
35	Aug-2024	Sales	3916182	2077523	Core Operations	1838659	46.950295
36	Aug-2024	Operations	3870690	1031236	Core Operations	2839454	73.357825
37	Aug-2024	Admin	0	1228178	Support Services	-1228178	0.000000
38	Aug-2024	Finance	0	1265894	Support Services	-1265894	0.000000
39	Aug-2024	IT	0	1189492	Support Services	-1189492	0.000000
40	Sep-2024	Sales	2805416	1173254	Core Operations	1632162	58.178965
41	Sep-2024	Operations	3946609	1365987	Core Operations	2580622	65.388337
42	Sep-2024	Admin	0	2019512	Support Services	-2019512	0.000000
43	Sep-2024	Finance	0	1988507	Support Services	-1988507	0.000000

	Month	Department	Revenue_NGN	Expenses_NGN	Category	Profit_NGN	Profit_Margin_%
44	Sep-2024	IT	0	1988205	Support Services	-1988205	0.000000
45	Oct-2024	Sales	2965689	768148	Core Operations	2197541	74.098835
46	Oct-2024	Operations	3325665	1348531	Core Operations	1977134	59.450787
47	Oct-2024	Admin	0	2000571	Support Services	-2000571	0.000000
48	Oct-2024	Finance	0	1606606	Support Services	-1606606	0.000000
49	Oct-2024	IT	0	1378843	Support Services	-1378843	0.000000
50	Nov-2024	Sales	1756508	1503591	Core Operations	252917	14.398853
51	Nov-2024	Operations	2396942	806530	Core Operations	1590412	66.351710
52	Nov-2024	Admin	0	1304365	Support Services	-1304365	0.000000
53	Nov-2024	Finance	0	1160337	Support Services	-1160337	0.000000
54	Nov-2024	IT	0	2473415	Support Services	-2473415	0.000000
55	Dec-2024	Sales	3555555	1505889	Core Operations	2049666	57.646865
56	Dec-2024	Operations	3008349	908261	Core Operations	2100088	69.808656
57	Dec-2024	Admin	0	2089673	Support Services	-2089673	0.000000
58	Dec-2024	Finance	0	2063715	Support Services	-2063715	0.000000
59	Dec-2024	IT	0	1920405	Support Services	-1920405	0.000000

In [7]:
```
# Preview the first few row
df.head()
```

Out[7]:

	Month	Department	Revenue_NGN	Expenses_NGN	Category	Profit_NGN	Profit_Margin_%
0	Jan-2024	Sales	3719110	1371155	Core Operations	2347955	63.132174
1	Jan-2024	Operations	3729084	2114414	Core Operations	1614670	43.299373
2	Jan-2024	Admin	0	959178	Support Services	-959178	0.000000
3	Jan-2024	Finance	0	2392743	Support Services	-2392743	0.000000
4	Jan-2024	IT	0	810268	Support Services	-810268	0.000000

In [9]:
```
df.info()
df.describe()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 60 entries, 0 to 59
Data columns (total 7 columns):
 #   Column           Non-Null Count  Dtype  
---  ------           --------------  -----  
 0   Month            60 non-null     object 
 1   Department       60 non-null     object 
 2   Revenue_NGN      60 non-null     int64  
 3   Expenses_NGN     60 non-null     int64  
 4   Category         60 non-null     object 
 5   Profit_NGN       60 non-null     int64  
 6   Profit_Margin_%  60 non-null     float64
dtypes: float64(1), int64(3), object(3)
memory usage: 3.4+ KB
```

Out[9]:

	Revenue_NGN	Expenses_NGN	Profit_NGN	Profit_Margin_%
count	6.000000e+01	6.000000e+01	6.000000e+01	60.000000
mean	1.179235e+06	1.589183e+06	-4.099479e+05	16.680565
std	1.536912e+06	4.903423e+05	1.610409e+06	27.043171
min	0.000000e+00	7.410900e+05	-2.473415e+06	-19.980009
25%	0.000000e+00	1.217649e+06	-1.720426e+06	0.000000
50%	0.000000e+00	1.609681e+06	-1.173284e+06	0.000000
75%	2.773418e+06	1.991523e+06	1.175411e+06	43.203825
max	3.946609e+06	2.473415e+06	2.839454e+06	74.098835

In [18]:
```
# Any missing values?
df.isnull().sum()

# Check unique departments and months
df['Department'].unique()
df['Month'].unique()
```

Out[18]:
```
array(['Jan-2024', 'Feb-2024', 'Mar-2024', 'Apr-2024', 'May-2024',
       'Jun-2024', 'Jul-2024', 'Aug-2024', 'Sep-2024', 'Oct-2024',
       'Nov-2024', 'Dec-2024'], dtype=object)
```

In [20]:
```
df["Month"] = pd.to_datetime(df["Month"], format="%b-%Y")
```

In [22]:
```
total_revenue = df["Revenue_NGN"].sum()
total_expenses = df["Expenses_NGN"].sum()
total_profit = df["Profit_NGN"].sum()
average_margin = df["Profit_Margin_%"].mean()

print("Total Revenue: ₦{:,.0f}".format(total_revenue))
print("Total Expenses: ₦{:,.0f}".format(total_expenses))
print("Total Profit: ₦{:,.0f}".format(total_profit))
print("Average Profit Margin: {:.2f}%".format(average_margin))
```

```
Total Revenue: ₦70,754,081
Total Expenses: ₦95,350,955
Total Profit: ₦-24,596,874
Average Profit Margin: 16.68%
```

In [24]:
```
monthly_summary = df.groupby("Month")[["Revenue_NGN", "Expenses_NGN", "Profit_NGN"]].sum().reset_index()
monthly_summary
```

Out[24]:

	Month	Revenue_NGN	Expenses_NGN	Profit_NGN
0	2024-01-01	7448194	7647758	-199564
1	2024-02-01	5966669	9222188	-3255519
2	2024-03-01	5550522	7010963	-1460441
3	2024-04-01	4697524	8693978	-3996454
4	2024-05-01	5658777	7938303	-2279526
5	2024-06-01	6170922	8861944	-2691022
6	2024-07-01	3713868	7809153	-4095285
7	2024-08-01	7786872	6792323	994549
8	2024-09-01	6752025	8535465	-1783440
9	2024-10-01	6291354	7102699	-811345
10	2024-11-01	4153450	7248238	-3094788
11	2024-12-01	6563904	8487943	-1924039

In [26]:
```
department_summary = df.groupby("Department")[["Revenue_NGN", "Expenses_NGN", "Profit_NGN"]].sum().reset_index()
department_summary
```

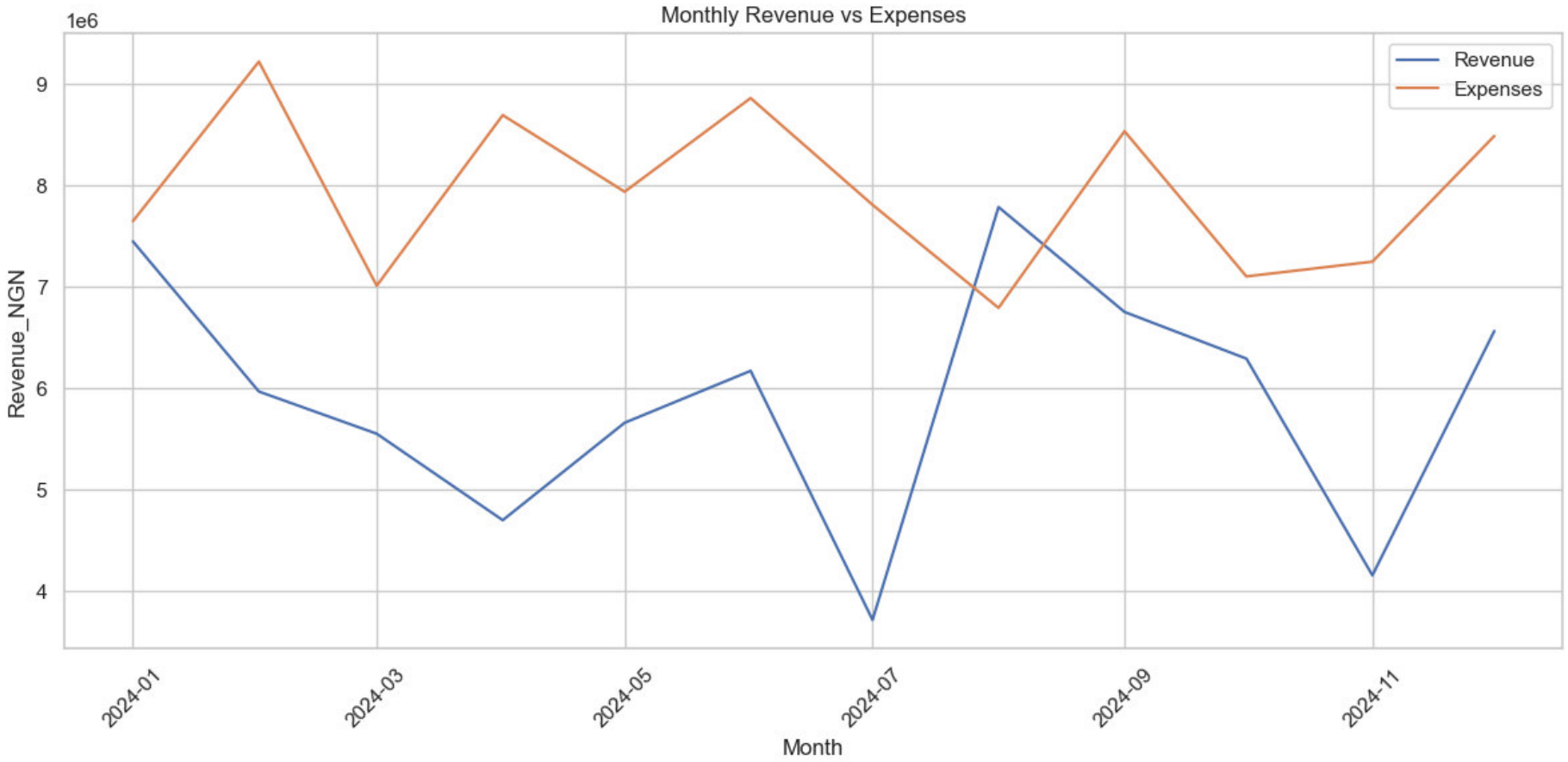
Out[26]:

	Department	Revenue_NGN	Expenses_NGN	Profit_NGN
0	Admin	0	18764760	-18764760
1	Finance	0	19946086	-19946086
2	IT	0	18549947	-18549947
3	Operations	35832696	18145855	17686841
4	Sales	34921385	19944307	14977078

In [28]:
```
import matplotlib.pyplot as plt
import seaborn as sns

sns.set(style="whitegrid")
```

In [51]:
```
plt.figure(figsize=(12,6))
sns.lineplot(data=monthly_summary, x="Month", y="Revenue_NGN", label="Revenue")
sns.lineplot(data=monthly_summary, x="Month", y="Expenses_NGN", label="Expenses")
plt.title("Monthly Revenue vs Expenses")
plt.xticks(rotation=45)
plt.tight_layout()
plt.savefig("Revenue Vs Expenses.png")
plt.show()
```



Monthly Revenue vs Expenses

Revenue showed fluctuations across the year, with the lowest point in July 2024 and noticeable rebounds in August and December.

Expenses remained consistently higher than revenue in most months, suggesting operational inefficiencies or underperformance in revenue generation.

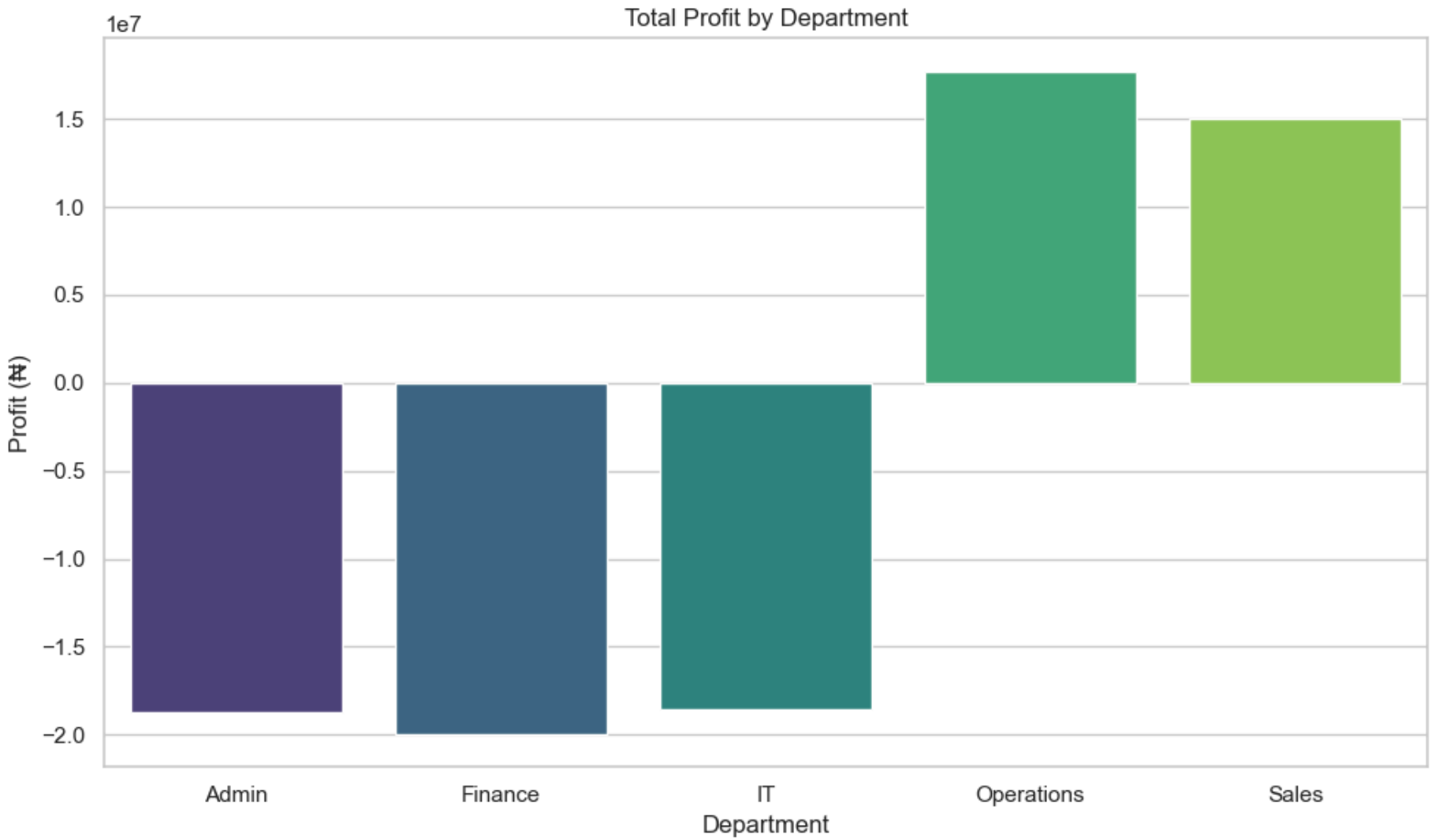
The gap between revenue and expenses was narrowest in August — potentially indicating a period of better cost control or improved income

In [49]:
```
plt.figure(figsize=(10,6))
sns.barplot(data=department_summary, x="Department", y="Profit_NGN", palette="viridis")
plt.title("Total Profit by Department")
plt.ylabel("Profit (₦)")
plt.tight_layout()
plt.savefig("Profit_department.png")
plt.show()
```

```
C:\Users\salaudeen.j\AppData\Local\Temp\ipykernel_27424\2716844730.py:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and se
t `legend=False` for the same effect.

  sns.barplot(data=department_summary, x="Department", y="Profit_NGN", palette="viridis")
```



Total Profit by Department

Profitability analysis by department reveals that:

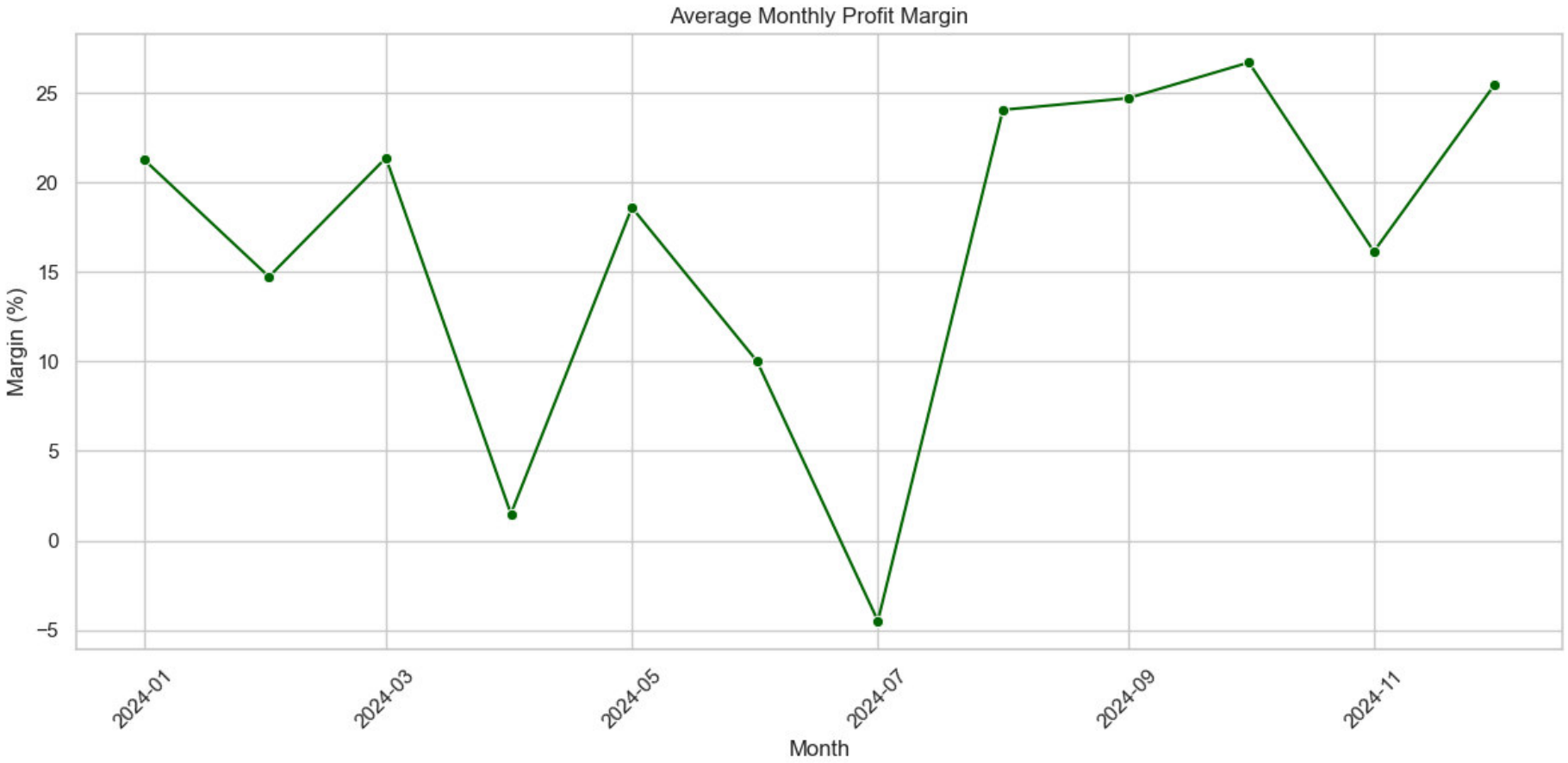
Operations and Sales are the primary profit drivers, each generating over ₦15 million in profit.

In contrast, Admin, Finance, and IT all posted negative profits (losses), with IT and Admin incurring losses above ₦18 million each.

This reflects typical overhead behavior in support departments, but the extent of losses may indicate a need for tighter cost control or cost-benefit review.

In [47]:
```
monthly_margin = df.groupby("Month")["Profit_Margin_%"].mean().reset_index()

plt.figure(figsize=(12,6))
sns.lineplot(data=monthly_margin, x="Month", y="Profit_Margin_%", marker="o", color="darkgreen")
plt.title("Average Monthly Profit Margin")
plt.ylabel("Margin (%)")
plt.xticks(rotation=45)
plt.tight_layout()
plt.savefig("monthly_margin.png")
plt.show()
```



Average Monthly Profit Margin

Profit margins were highly volatile throughout the year. A sharp dip occurred in April and July, with July recording a negative margin (loss) — possibly due to peak expenses and low revenue. Margins recovered significantly in August, September, and October, with October seeing the highest margin for the year at over 26%. The Q3 recovery could indicate strategic adjustments or seasonal business improvements

In [ ]:
```
!jupyter nbconvert "Report.ipynb" --to html
```

In [ ]:
```

```

In [ ]:

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