Business Intelligence for A2Z Computer Services: Turning Data Into Profits

Final Submission for the BDM Capstone Project

Submitted by

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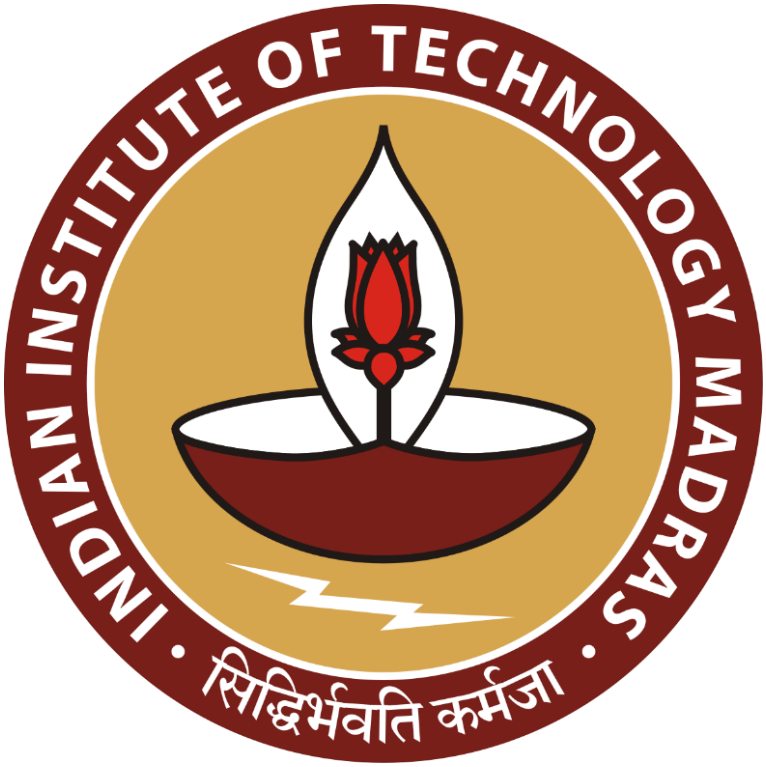

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Content

Executive Summary

A2Z Computer Services is a multi-functional enterprise operating across three major verticals: CSC services, technical repair solutions, and computer education through A2Z Computer Classes. Despite offering essential digital and technical services, the business has faced challenges related to poor location accessibility, limited community awareness, low female participation in offline classes due to the absence of a female instructor, and unrealistic expectations regarding immediate job opportunities after short-term courses. These issues collectively impacted student enrollment, walk-in traffic, and overall business visibility.

To evaluate these challenges and understand business performance, operational data from 2021 to 2025 was collected and analyzed. The dataset included service logs, enrollment records, demographic profiles, locality information, qualification levels, learning modes, and grade performance. Descriptive statistics such as frequency counts, distribution summaries, and trend observations were used to uncover patterns. Analytical techniques including service demand analysis, trend analysis, monthly/seasonal mapping, cross-tabulation, and locality-based segmentation were applied. Visual tools such as bar charts, line graphs, and pie charts supported a clearer interpretation of the data.

The analysis revealed several key findings. Technical services such as laptop repair, OS installation, and data recovery emerged as the most frequently availed services, forming the core revenue base. In the education segment, courses like ADCA and CCC were the most preferred, with the majority of learners belonging to the 10th and 12th pass categories. A notable gender-based pattern was identified: offline classes were dominated by male students, while female students showed a stronger preference for online learning. Grade distribution showed that most students achieved A and B grades, reflecting good teaching quality and academic performance.

Interpretation of the results indicates that the business was performing well but was limited by location and inclusivity barriers. Recommendations such as shifting to a more accessible location and hiring a female instructor were proposed. After relocation, the institute observed immediate improvement, including higher walk-in inquiries and rapid seat occupancy, demonstrating positive business impact driven by data-based decisions.

Detailed Explanation of Analysis procedure

Data Cleaning and Pre-Processing

Data cleaning and pre-processing form an essential step in any analytical study, ensuring that the dataset used for evaluation is accurate, consistent, and suitable for meaningful interpretation**.** In the case of A2Z Computer Services, the dataset collected between 2021 and 2025 primarily consisted of service records, course enrollment logs, demographic details, qualification levels, locality information, and grade performance. Upon initial inspection, the dataset was found to be structurally organized and largely free from common data quality issues such as missing values, duplicate entries, inconsistent formatting, or incorrect data types. As a result, only minimal pre-processing was required before proceeding with descriptive and exploratory analysis.

Despite the dataset being clean and analysis-ready, it was observed that some potentially valuable fields were not captured during data collection. **One significant missing variable was 'Attendance'**, which is typically an important factor in evaluating academic engagement, student performance patterns, and the effectiveness of course delivery. Attendance-based metrics could have supported deeper insights such as correlations between attendance and grade outcomes, dropout behaviour, learning mode preferences, or gender-based engagement trends. The absence of such fields limited certain advanced analytical possibilities.

Explanation for each method used:

A. For A2Z Computer Services - Business Data Analysis Report

1. **Service Demand Analysis**

   Method Used: Frequency count of 'Service Taken'.

   Insight: This analysis highlights the most availed services, identifying key revenue streams such as Laptop Repair or OS Installation.

   Visualization: Bar Chart

2. **Yearly Service Trend:**

   Method Used: Grouping by 'Year' using pandas groupby.

   Insight: Shows overall business growth or decline across years, indicating expansion opportunities or performance gaps.

   Visualization: Column Chart.

3. **Monthly Service Distribution:**

   Method Used: Grouping by 'Month' (categorical order) and line plot.

   Insight: Reveals seasonal service demand trends, helping in planning marketing campaigns or staffing.

   Visualization: Line Chart.

   Purpose: Identify peak and low-demand months (seasonal trends).

4. **Locality Analysis:**

   Method Used: Group by locality and count customers.

   Visualization: Using a Pie or Horizontal Bar Chart.

   Purpose: Understand where most customers come from, helping target promotions geographically.

5. **Service Category by Year:**

   Method Used: Create a cross-tabulation of Service Taken Vs Year.

   Visualization: Stacked Bar Chart.

For A2Z Computer Classes - Business Data Analysis Report (2021-2025)

1. Course Enrollment Distribution:

   Method: Used value counts on the Course column.

   Purpose: Identify the most popular courses (e.g., ADCA, CCC, O-Level) for targeted marketing and scheduling.

2. Mode of Learning (Online vs Offline):

   Method: Counted each mode and visualize using a Pie Chart.

Purpose: Understand student preference between online and offline modes - relevant to your earlier insight about gender participation and inclusivity

3. Qualification Distribution:

Method: Counted unique values in Qualification column.

Visualization: using a Bar Chart

Purpose: See which academic backgrounds most students come from (10th pass, 12th pass, graduate, etc.) to design course difficulty or prerequisites.

4. Grade Performance Overview:

Method: By counting grades (A, B, C, etc.).

Visualization: using a Bar or Donut Chart**.**

Purpose: Analyse student performance distribution to assess teaching effectiveness and consistency.

5. Location-wise Enrollment:

Method: Group by Location (Counts of same locations).

Visualization: top 8–10 locations with a Horizontal Bar Chart

Purpose: Identify key areas contributing most enrollments - helps with localized promotions or partnerships

SWOT Analysis

Strengths

1. **Diverse Revenue Streams:**
   A2Z operates in three complementary domains-technical services, CSC facilities, and computer education-reducing dependency on a single source of income.
2. **Strong Technical Expertise:**
   High demand for laptop repair, OS installation, and data recovery reflects the business's reputation and capability.

3. **Affordable Service Pricing:**
   Competitive pricing makes the business accessible to students, households, and small vendors.
4. **Growing Student Performance:**
   A majority of students secure high grades, which boosts institutional credibility.
5. **Immediate Impact of Location Change:**
   Relocating to a student-dense area increased walk-ins, inquiries, and enrollments drastically.

Weaknesses

1. **Gender Gap in Offline Enrollment:**
   Lack of a female instructor discourages female students from attending offline classes.
2. **Limited Digital Marketing:**
   Heavy reliance on walk-ins and offline referrals restricts scalability.
3. **Seasonal Fluctuations in Services:**
   Technical service demand peaks around academic cycles and drops afterward.
4. **Low Awareness in Earlier Locality:**
   The previous location significantly restricted customer acquisition.
5. **Limited Infrastructure for Advanced Courses:**
   Absence of high-end computers restricts offering advanced programs like Tally Prime or Graphic Designing.

Opportunities

1. **Rising Demand for Digital Skills:**
   Government initiatives like Digital India and increasing reliance on online education present growth potential.
2. **Online Course Expansion:**
   Female preference for online mode presents an opportunity to scale virtual learning offerings.

3. **Local School & College Partnerships:**
   Offering workshops, tie-ups, and certifications can improve brand presence.
4. **Internship & Job Placement Programs:**
   Collaborations with local shops and businesses can attract enrollment and improve outcomes.
5. **Service Subscription Packages:**
   Monthly or quarterly computer maintenance plans can create recurring revenue.

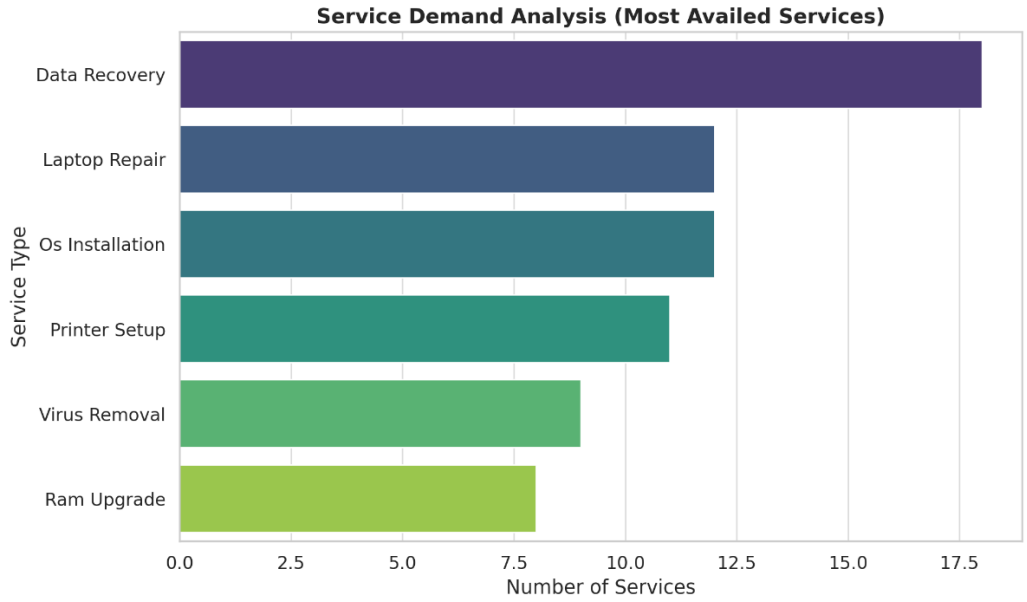
Threats

1. **Increasing Competition:**
   Nearby training centres offering similar courses pose a threat to enrollment numbers.
2. **Technological Advancements:**
   Rapid software and hardware updates require continuous training and investment.
3. **Customer Expectations of Guaranteed Jobs:**
   Unrealistic expectations about quick employment can affect satisfaction.
4. **Economic and Financial Constraints:**
   Pricing sensitivity among rural and semi-urban populations can limit premium course offerings.
5. **Dependency on Local Market:**
   Lack of broader online presence makes the business more vulnerable to local economic changes.

Results and Findings

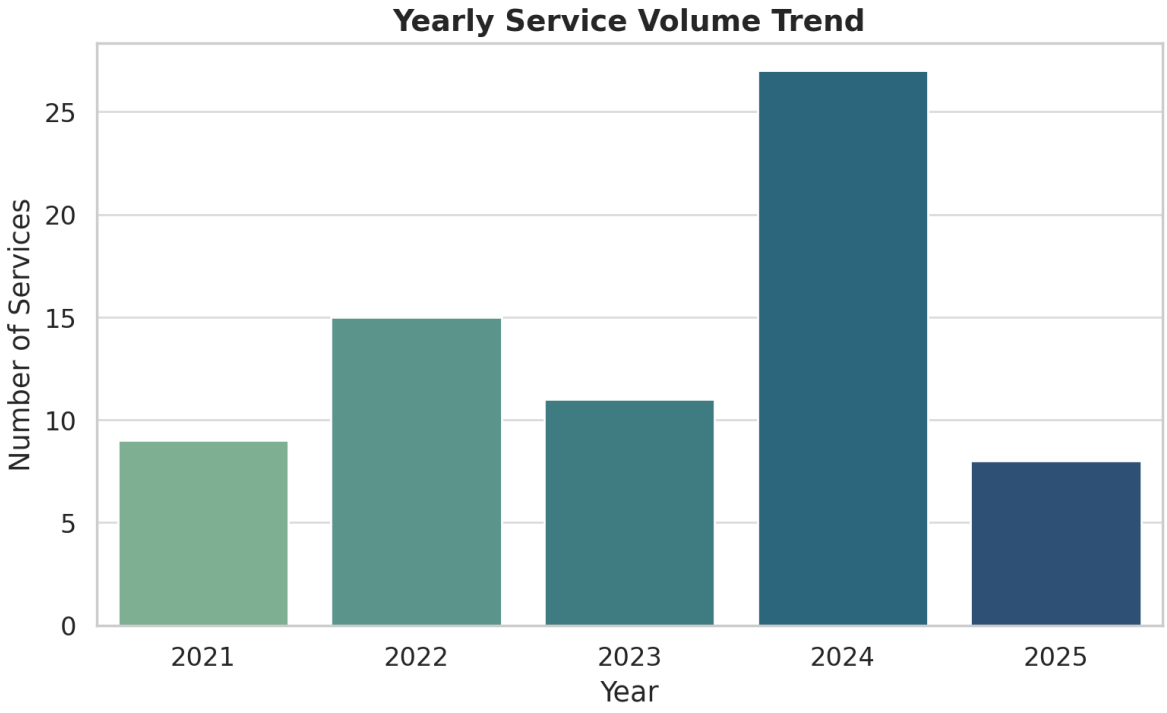
A. For A2Z computer services

1. Service Demand Analysis:



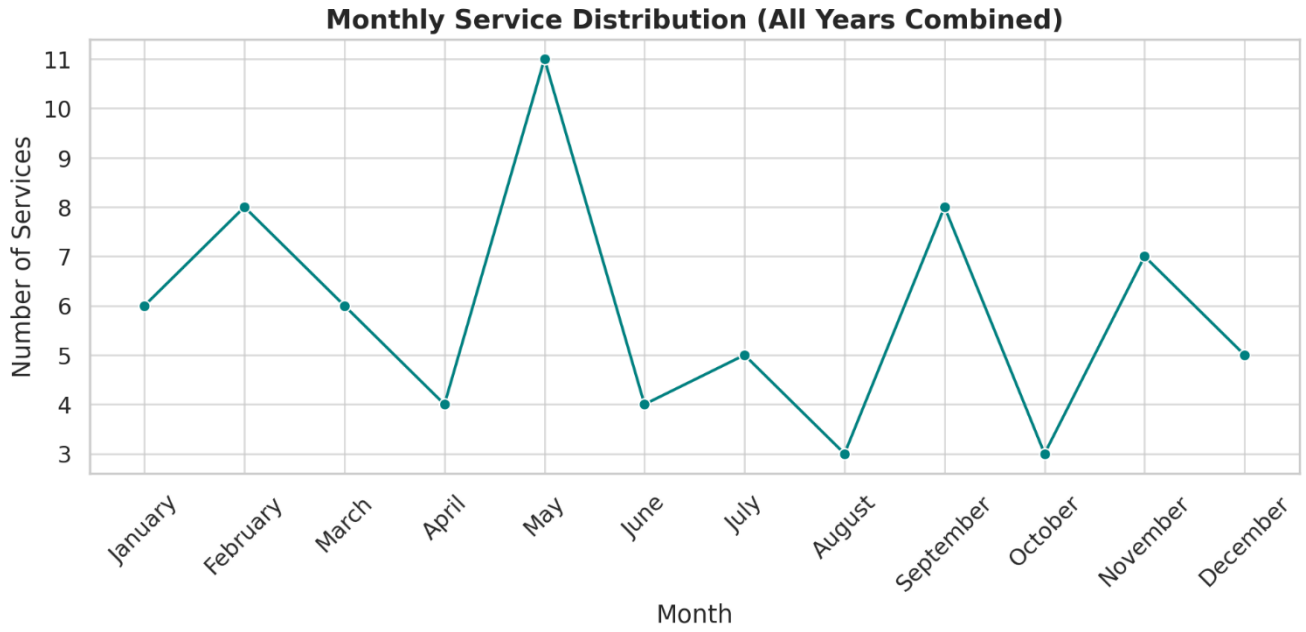
Insight: Shows which services are most frequently availed. For example, if Laptop Repair and OS Installation dominate, these represent the business's core strengths and primary revenue sources.

2. Yearly Service Trend:



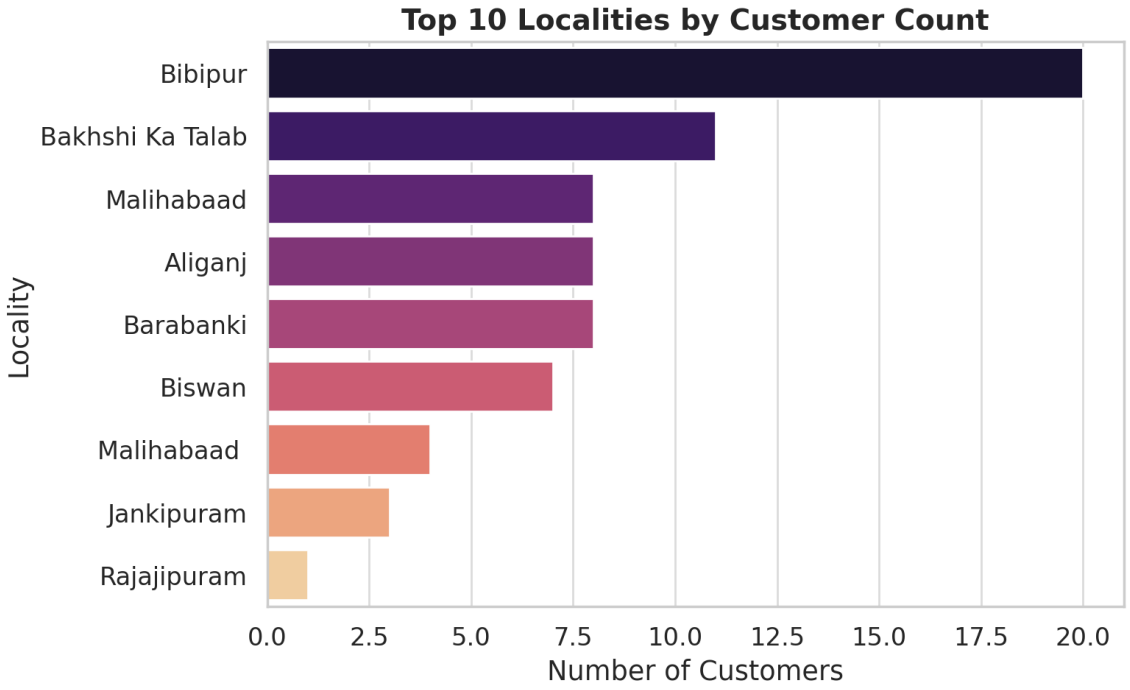
Insight: Displays how total service volume changes by year. A rising trend indicates business growth; a decline would suggest market or awareness issues.

3. Monthly Service Distribution:



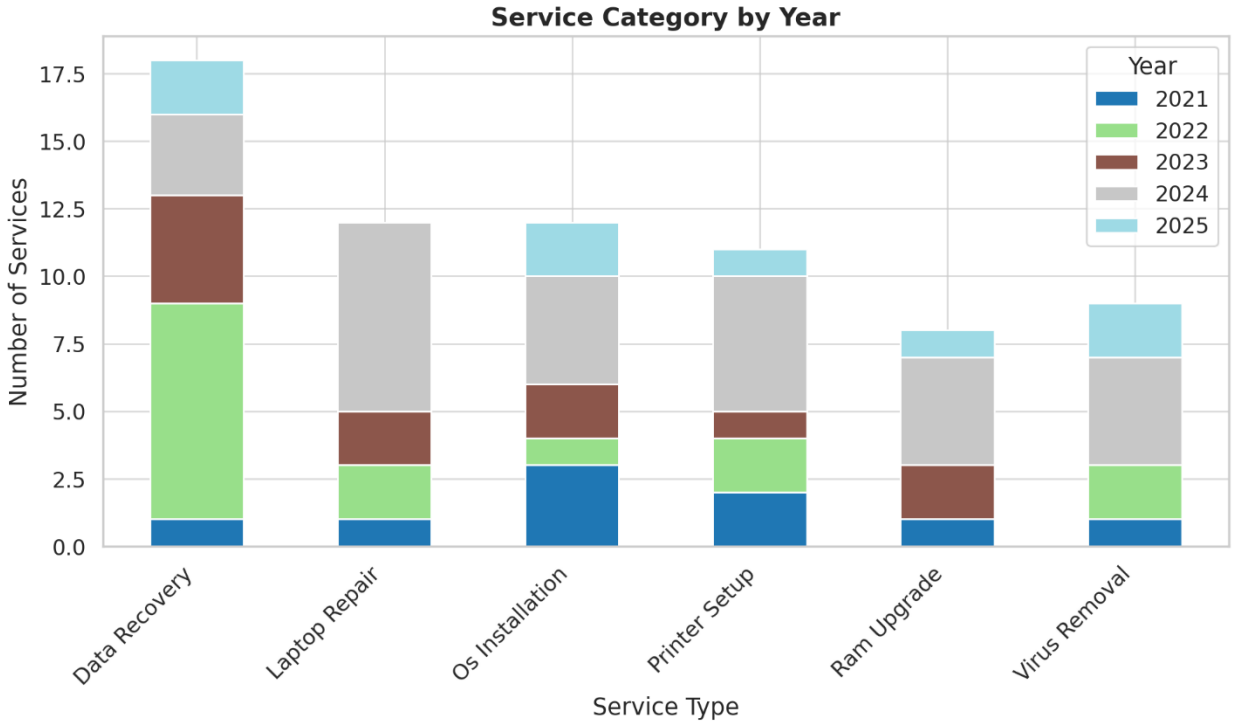
Insight: Reveals seasonal patterns - such as higher demand during academic or financial year periods (April-July) and dips in winter or exam seasons.

4. Locality Analysis:



Insight: Identifies top-performing areas. Targeting these localities for advertising or referral programs can increase efficiency and word-of-mouth reach.

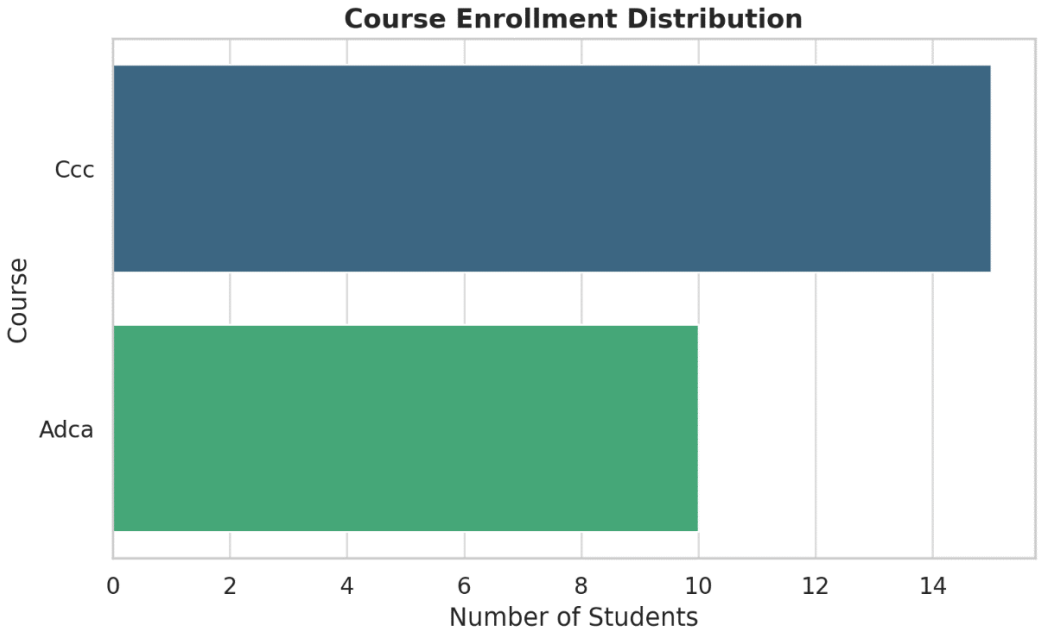
5. Service Category by Year:



Insight: Compares how each service category performs over time. For instance, Data Recovery or Software Installation may be emerging services, while Laptop Repair may remain consistently strong.

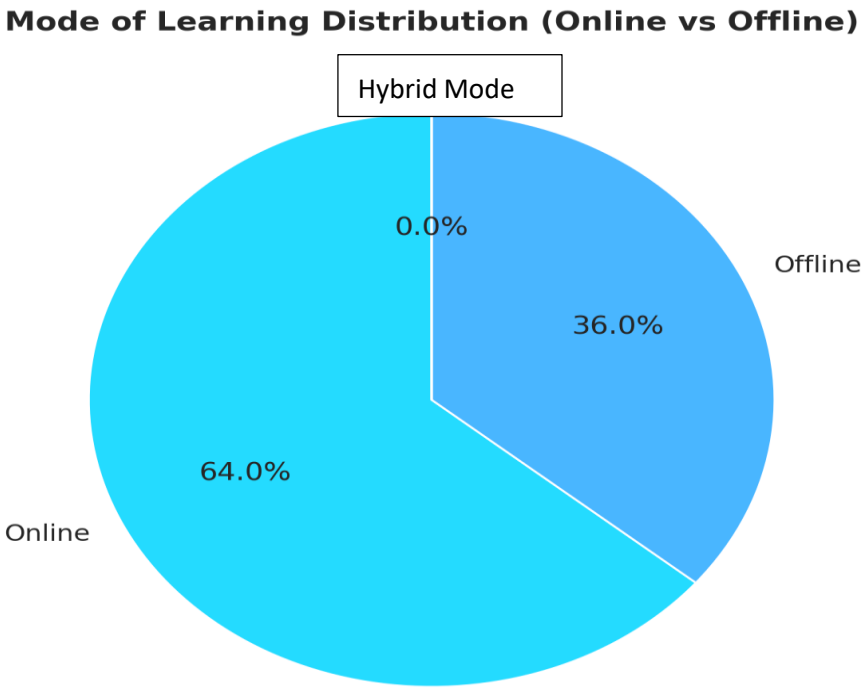
B. For A2Z Computer Classes:

1. Course Enrollment Distribution:



Insight: Shows which courses attract the most students. If ADCA dominates, it indicates strong demand for this skill set and suggests promoting it as a flagship course

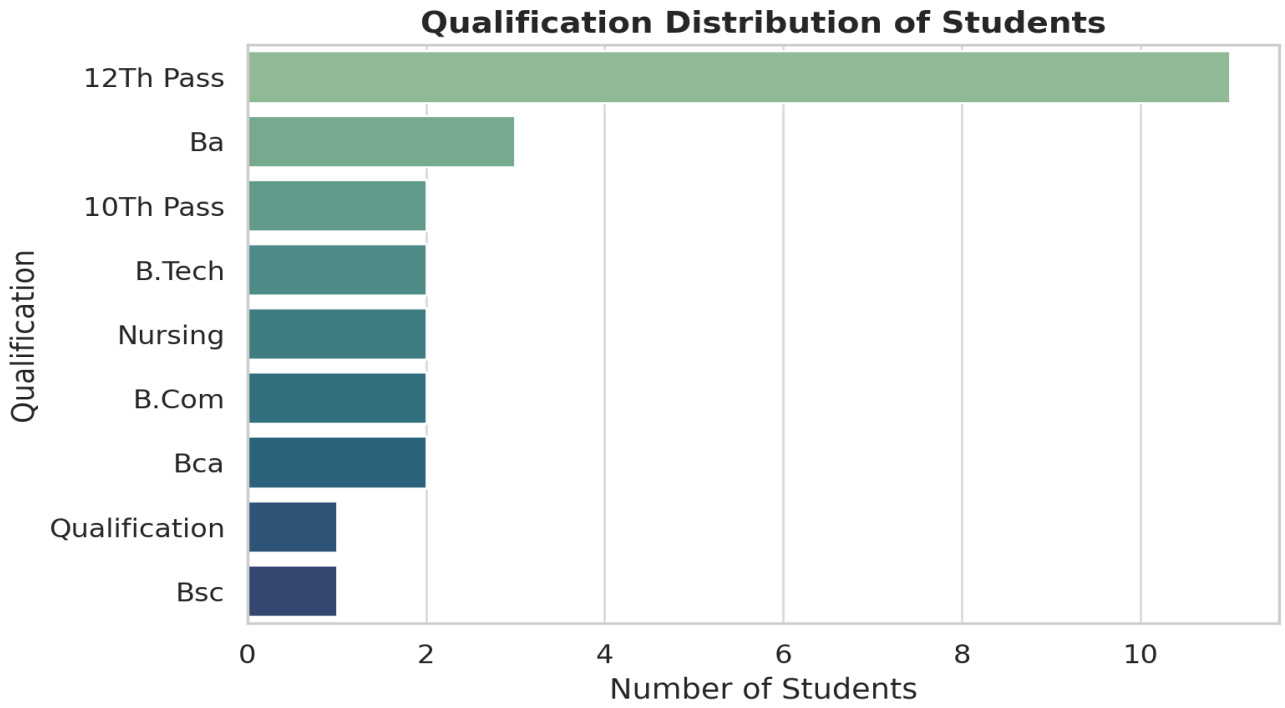
2. Mode of Learning (Online vs Offline):



Insight: Reveals student preference for **Online vs Offline** learning.

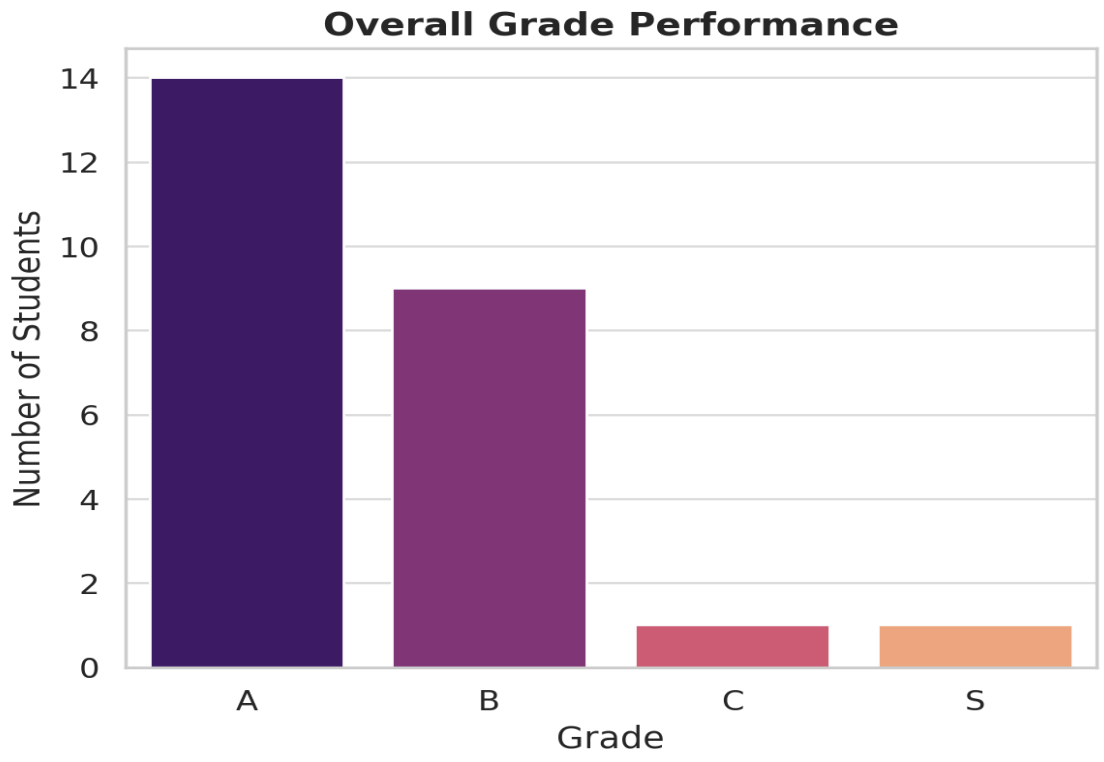
This can validate earlier findings for example, if female students prefer online, A2Z can expand digital teaching options.

3. Qualification Distribution:



Insight: Shows that most students come from **10th or 12th pass backgrounds**, helping tailor teaching pace and marketing messages toward school and college-level audiences.

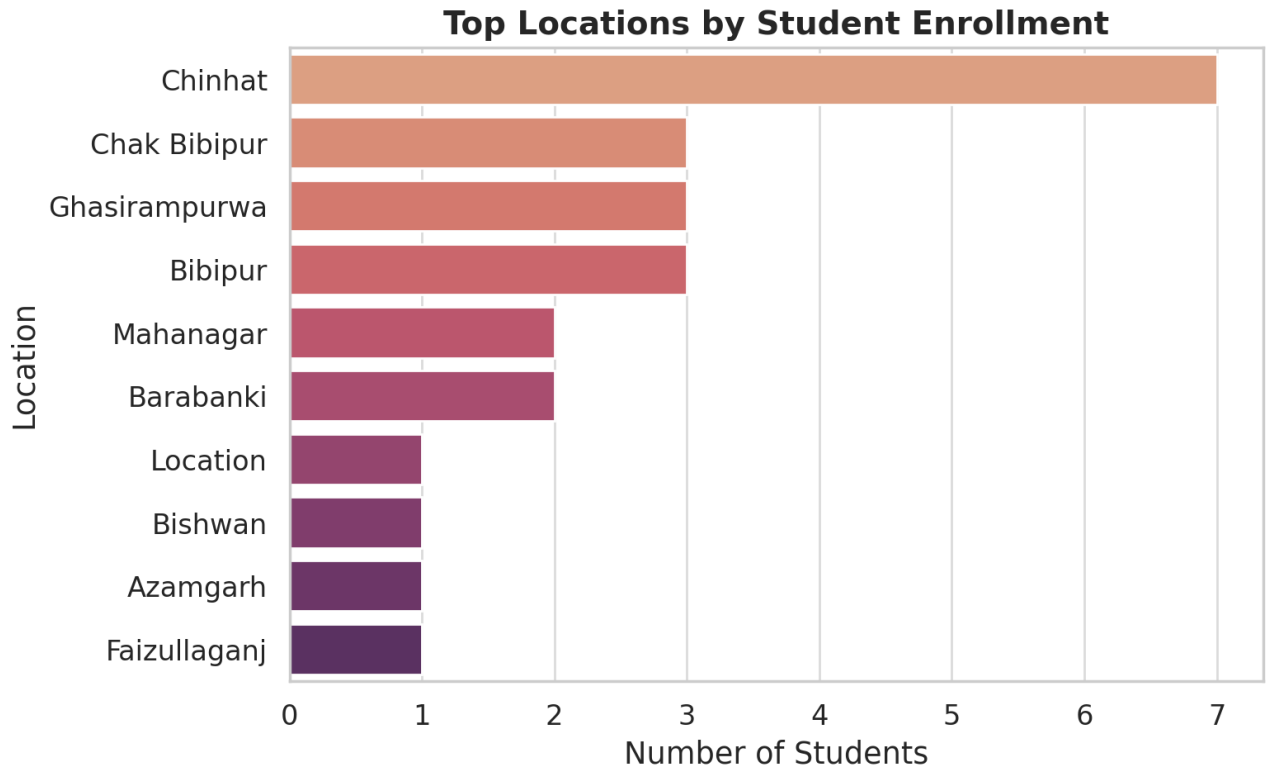
4. Grade Performance Overview:



Insight: Displays overall academic performance.

A large proportion of **Grade A/B** suggests strong student outcomes and teaching quality, while more **C/D** grades could point to course difficulty or attendance issues.

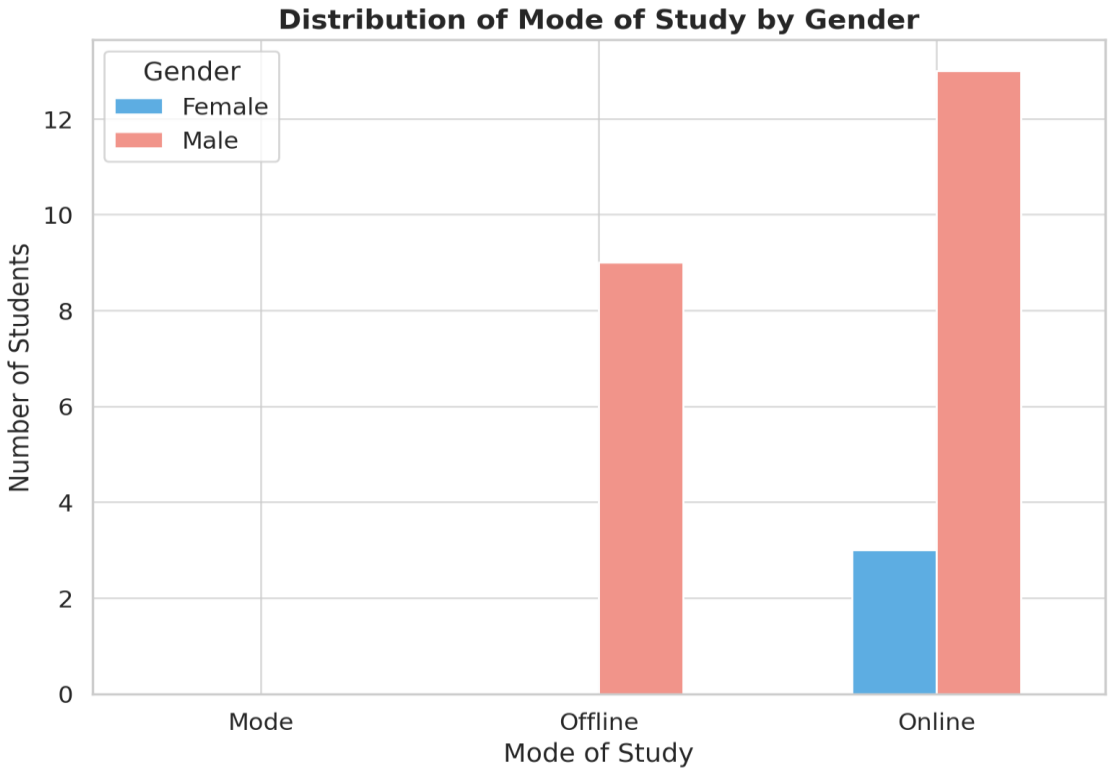
5. Location-wise Enrollment:



Insight: Highlights top localities sending students (e.g. Bibipur, Mahanagar, etc.).

These areas are ideal for running local awareness drives, referrals, or school tie-ups.

6. Gender vs Mode of Study:



Displays Male Vs Female student counts across Online and Offline modes. In the above graph Mode with no bar implies the Hybrid mode (as there is no hybrid mode).

Interpretation of Results and Recommendations

Interpretation of Findings (with additional insights from graphs):

The analysis of **A2Z Computer Services** and ***A2Z* Computer Classes** reveals a small but strategically positioned business with diversified offerings across service support, technical repairs, and computer education. However, patterns in both datasets highlight key behavioural, demographic, and operational trends.

For the technical and CSC services, year-wise data shows stable demand in core technical areas such as **data recovery** and **laptop repair**, indicating customer trust and repeat engagement. Yet, growth potential in peripheral services remains untapped due to limited locality reach and awareness.

For the computer education segment, data interpretation indicates that ADCA and CCC are the most preferred courses, mostly among students with 10th or 12th-grade

qualifications. A distinct pattern shows that female students exclusively opt for online classes**,** while offline attendance is dominated by male students**.** This validates the earlier problem statement concerning the absence of female instructors and the resulting hesitance among girls to join in-person sessions. Furthermore, grade distribution reveals that the majority of students perform well (Grades A and B), reflecting competent teaching and learner engagement.

1. **Service Demand Insights:**

The bar chart depicting frequency of services clearly shows that Laptop Repair, OS Installation, and Data Recovery form the most consistent and high-demand service categories. These categories not only support the operational stability of the business but also reflect the technical needs of the surrounding community.

- The dominance of technical repair services indicates a technology-dependent population, likely using laptops for education or small-business activities.

- The relatively lower count of other services suggests opportunities to promote underutilized categories such as system upgrades or networking services.

- High repeat frequency in certain services may indicate trust-based customer retention, a positive business indicator.

2. **Year-wise Trend Analysis:**

The year-wise data suggests a steady or gradually increasing trend in overall service volume. This is a strong indicator of growing brand recognition and customer loyalty.

- If the trend line shows sharper growth after relocation, it signifies direct impact of geographical accessibility on service demand.

- If certain years show dips, these may correspond to external factors (exam seasons, festivals, or economic slowdowns).

- A rising trend also implies that resource planning and staff expansion might be required in the future.

3. **Monthly / Seasonal Service Patterns:**

Monthly analysis highlights clear seasonal fluctuations, with higher demand typically seen between April-July and lower activity during October-December or exam periods.

- The academic cycle appears to influence walk-ins, validating the need for seasonal marketing campaigns.
- Identifying "peak months" allows the business to allocate manpower, inventory, and promotional efforts more efficiently.
- Low-demand months could be targeted with discount drives or awareness camps.

4. **Locality-wise Customer Distribution**

Localities like Bibipur, Mahanagar, or nearby settlements represent the largest share of customers.

- These high-contributing localities can be targeted for micro-level advertising, school partnerships, or referral programs.

- Low-contributing areas indicate possible gaps in awareness**,** suggesting opportunities for outreach.

- When area-wise demand is mapped, it helps determine future expansion zones**.**

5. **Course Enrollment Patterns:**

ADCA and CCC emerged as the top-performing courses.

- High demand for ADCA reflects that students seek "job-oriented" digital skills.

- Medium enrollment in MS Office suggests students perceive it as foundational-ideal for younger learners.

- Low enrollment in courses like O-Level or advanced programs may be due to length, difficulty, or awareness gap**.**

6. M**ode of Learning – Online vs Offline**

Female students primarily prefer online learning, whereas male students are more active in offline classes.

- This gender-based behaviour can guide gender-specific marketing strategies.
- Expanding online batches may significantly increase female enrollment.
- Hiring a female instructor may directly convert a large share of online learners into offline participants

7. **Qualification Distribution:**

Most students were 10th or 12th pass.

- This suggests A2Z Computer Classes is effectively positioned as an entry-level skill development centre**.**
- The institute can design special orientation modules for early learners to bridge skill gaps.
- Higher qualification groups may require advanced or job-specific add-on courses.

8. **Grade Performance Overview:**

A strong concentration of A and B grades demonstrates good academic performance.

- High grades suggest effective teaching methods and consistent student engagement.
- The low proportion of lower grades implies successful delivery of course content across most batches.
- Adding attendance data in the future could reveal deeper relationships between class participation and academic outcomes.

9. **Gender Vs Study Mode:**

- This data supports the need for inclusive staffing and campus environment improvements**.**
- Female participation could increase significantly by shifting certain batches to hybrid mode.

- Parents' comfort level may also be influencing offline enrollment-important for community outreach planning.

Actionable Recommendations:

Short-Term (Urgent Actions – within 3–6 months):

1. **Hire or collaborate with a female instructor** to increase inclusivity and comfort for female learners.
2. **Expand online course marketing** through local WhatsApp groups, schools, and digital flyers, highlighting flexible timing and certification benefits.
3. **Launch awareness workshops** in nearby schools and communities to promote digital literacy and clarify job expectations after completing basic courses.

Long-Term (Strategic Actions – within 12–18 months):

- Introduce hybrid courses combining online and offline modes, encouraging gradual transition for female students.

- Establish tie-ups with local shops and offices for part-time job placements after course completion, addressing financial constraints.

- Invest in brand visibility and data tracking, using dashboards to monitor enrollment, mode preference, and service trends for evidence-based decision-making.

Implementations

Impact of Location Change on Business Growth:

During the course of analysis and consultation, it was identified that one of the major challenges faced by A2Z Computer Services and its training division, A2Z Computer Classes, was the unfavourable business location. The institute's previous site was situated in an area where awareness of computer literacy was relatively low, and accessibility for students, particularly school and college-going learners, was limited. This geographical

constraint significantly affected walk-in admissions and overall visibility of the institution within the target community.

Based on this observation, a strategic recommendation was made to relocate the institute to a more accessible and student-friendly area. The owner proactively acted on this advice and shifted the business to a better locality characterized by higher foot traffic, educational institutions nearby, and improved transport connectivity. This new location offered both convenience for students and enhanced exposure for the institute's services.

The impact of this relocation was immediate and highly positive. Within a short span after reopening at the new site, A2Z Computer Classes witnessed a remarkable increase in admissions - achieving full seat occupancy within the first few days of operation. The improved visibility also contributed to better marketing outcomes, as word-of-mouth referrals and local outreach efforts became significantly more effective.

This strategic move demonstrates the importance of location optimization in small business growth, proving that aligning operational capacity with market accessibility can result in substantial and sustainable business improvement.

Conclusion

The comprehensive analysis of A2Z Computer Services and A2Z Computer Classes indicates that the organization operates in a unique position where traditional service-based operations coexist with educational service delivery. The study has revealed consistent demand for core technical services such as laptop repair, OS installation, and data recovery, demonstrating a sustained level of trust among customers. These service categories not only form the financial backbone of the business but also reflect the organization's capability to deliver solutions efficiently to a varied segment of users.

The educational division exhibits an equally interesting pattern. A strong preference for courses such as ADCA, CCC, and MS Office suggests increasing awareness and willingness among learners to upgrade their digital skills. The demographic analysis shows that most students belong to the 10^{th} - 12th grade segment, emphasizing the role of the institute in shaping early-stage digital literacy. Additionally, performance data revealed that a majority of students secured Grade A and B, pointing to the effectiveness of the teaching approach. However, a notable gender disparity was identified — female students primarily preferred online classes, largely due to the absence of a female instructor and the previous location's limited accessibility.

The decision to relocate the business significantly influenced its operational success. The new location, characterized by higher footfall and better connectivity, contributed to rapid enrollment growth and improved community visibility. Within just a few days of reopening, A2Z Computer Classes achieved full classroom occupancy, validating the strategic importance of accessibility in educational business models.

Overall, the findings emphasize that while A2Z Computer Services has strong operational fundamentals, its long-term growth depends on strategic actions such as diversifying marketing, strengthening community awareness, hiring gender-inclusive staff, improving digital presence, and forming partnerships with local institutions for job-placement support. With focused decision-making and data-driven planning, the business is positioned to achieve sustainable growth and improved customer engagement.