Forecasting: Art & Science

Patricia Fosness
Planning & Analysis Manager
Established in 1900
Opened in 1908
2010 Operating budget: $33 million
Volunteers: 1,800 active volunteers contributing 235,000 hours
Visitors: 1.42 million (onsite and offsite)
Members: 62,000 households (peak in August: 64,077)
Forecasting – Intuition is key

“Good judgment comes from experience and a lot of that comes from bad judgment”

Will Rogers 1879-1935

Watch out for Optimism Bias and Strategic Misrepresentation
Forecasting – an analytical view

- What do we want to forecast and why?
- What information do we need?
- What reliable data source we can use?
- How can we convert the data into quality information?
Data

Lost in Wonderland

Looking at data like this won’t help you find your way.

You need to discover a path through the chaos
## Data – summarized by time period

### Highlight categories

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| Temp Exhibit with Surcharge | New Permanent Exhibit | Temp Exhibit - No Surcharge |

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**Data Source:**

[Denver Museum of Nature & Science](https://www.denvermuseum.org)
Trends by month – General admission visitors

Baseline - Business as usual, no new attractions
Temporary Exhibit – No Surcharge
Temporary Exhibit with Surcharge
Trends by month and visitor group

- Paid General Admission
- Free General Admission
- Members
- Schools

**Average**

**Median**

**Best Case**

**Worst Case**
Look at the same data different ways

Capture by Month

Capture by Year
Forecast Attendance (000’s)
Temporary Exhibits every month but February
What really happened - Attendance (000’s)
Temporary Exhibits every month but February

Your results may vary
Member Households have increased

DMNS Membership Base 2005-2011

Households
Historical trends - Patterns

MONTHLY MEMBER CAPTURE RATE PERCENTAGES

Spring Break

September – school starts

Member Visits % of Member Households
Historical trends – Interactions

MONTHLY MEMBER CAPTURE RATE
PERCENTAGES

- Surcharged
- Temporary
- Exhibit

Member Visits % of Member Households
Upgrades % of Member Visits

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Jan-08 Mar-08 May-08 Jul-08 Sep-08 Nov-08 Jan-09 Mar-09 May-09 Jul-09 Sep-09 Nov-09 Jan-10 Mar-10 May-10 Jul-10 Sep-10 Nov-10 Jan-11 Mar-11 May-11 Jul-11

Member Visits % of Member Households
Upgrades % of Member Visits
Historical trends
Black Swans & Outliers

MONTHLY MEMBER CAPTURE RATE PERCENTAGES

Member Visits % of Member Households
Upgrades % of Member Visits

- Member Visits % of Member Households
- Upgrades % of Member Visits

DENVER MUSEUM OF NATURE & SCIENCE
Actual Example – Visitor Mix

- **Forecast**
  - Paid General Admission: 35%
  - Free General Admission: 17%
  - Members: 16%
  - Schools: 32%

- **Actual**
  - Paid General Admission: 35%
  - Free General Admission: 16%
  - Members: 35%
  - Schools: 14%

- **Baseline**
  - Paid General Admission: 40%
  - Free General Admission: 17%
  - Members: 12%
  - Schools: 31%

- **With Exhibit**
  - Paid General Admission: 28%
  - Free General Admission: 16%
  - Members: 11%
  - Schools: 45%
Ready for Takeoff

- Create a forecast – this is your Flight Plan
- Cross-Check before takeoff.
- Dead Reckoning as you proceed.