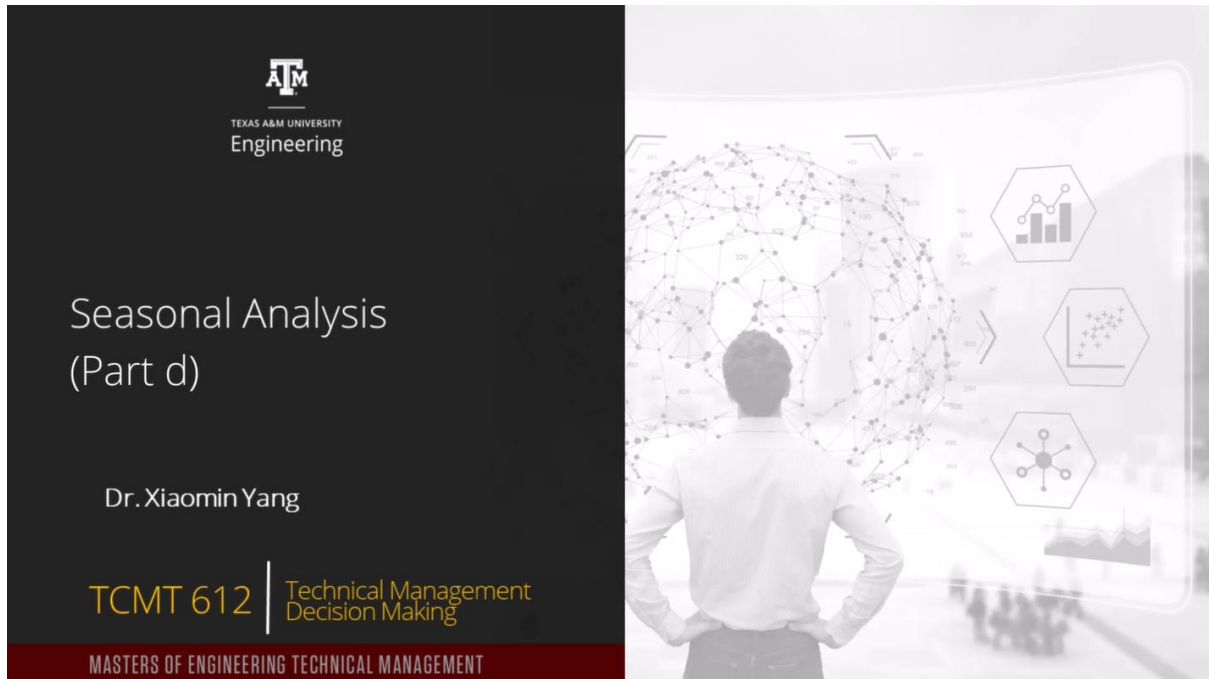


M6L6d. Seasonal Analysis

Slide #1



The slide cover is split into two main sections. The left section is a dark grey/black rectangle containing text and logos. The right section is a light grey image of a man in a white shirt standing with his back to the camera, looking at a large, futuristic digital display. The display shows a complex network graph on the left and several hexagonal icons on the right, each containing a different data visualization (bar chart, line graph, scatter plot, etc.).

ATM
TEXAS A&M UNIVERSITY
Engineering

Seasonal Analysis
(Part d)

Dr. Xiaomin Yang

TCMT 612 | Technical Management
Decision Making

MASTERS OF ENGINEERING TECHNICAL MANAGEMENT

Slide #2

Seasonal Indices

Time	12 month moving average	Seasonal index
Jul	\$2,366	0.90
Aug	\$2,398	1.10
Sep	\$2,431	1.13
Oct	\$2,464	0.93
Nov	\$2,498	1.08
Dec	\$2,530	0.97
Jan	\$2,559	0.95
Feb	\$2,590	0.95
Mar	\$2,623	1.09
Apr	\$2,657	0.95
May	\$2,690	1.00
Jun	\$2,721	0.96



Business insights: Hospital purchase decision cycles

Improve decisions:

- Allocate marketing resources to maximize sale
- Optimize production to minimize cost

The table and the chart show the Seasonal Index.

The calculated Seasonal Index is consistent with the business insights that we derive from the hospital purchase decision making process.

The monthly sales of the OSCT machine in each month of the third quarter of the year are significantly higher than that in the rest of the year.

So are the Seasonal Indexes in those three months.

On the other hand, if you do not know the underlying business reasons of the seasonal fluctuation, the seasonal indexes should help you analyze your clients and understand their purchase patterns.

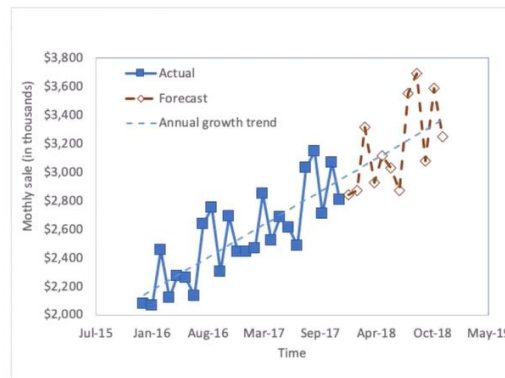
The seasonal index provides valuable data you can use to optimize your operation decisions, such as the allocation of marketing resources to maximize sale and optimize production to minimize cost.

Slide #3

Complete Forecasting

Time	Month	Label	Monthly sale (\$ thousands)	Annual trend	Seasonal index	Forecast
Jan-15	Jan		\$ 2,080	\$2,142	0.95	
Feb-15	Feb		\$ 2,068	\$2,177	0.95	
Mar-15	Mar		\$ 2,455	\$2,213	1.09	
Apr-15	Apr		\$ 2,124	\$2,146	0.95	
May-15	May		\$ 2,272	\$2,281	1.00	
Jun-15	Jun		\$ 2,241	\$2,317	0.96	
Jul-15	Jul		\$ 2,130	\$2,351	0.90	
Aug-15	Aug		\$ 2,640	\$2,387	1.10	
Sep-15	Sep		\$ 2,790	\$2,423	1.13	
Oct-15	Oct		\$ 2,800	\$2,459	0.93	
Nov-15	Nov		\$ 2,681	\$2,495	1.06	
Dec-15	Dec		\$ 2,442	\$2,537	0.97	
Jan-17	Jan		\$ 2,662	\$2,569	0.95	
Feb-17	Feb		\$ 2,466	\$2,599	0.90	
Mar-17	Mar		\$ 2,950	\$2,631	1.09	
Apr-17	Apr		\$ 2,323	\$2,667	0.95	
May-17	May		\$ 2,684	\$2,701	1.00	
Jun-17	Jun		\$ 2,613	\$2,737	0.96	
Jul-17	Jul		\$ 2,487	\$2,775	0.90	
Aug-17	Aug		\$ 3,024	\$2,807	1.10	
Sep-17	Sep		\$ 3,148	\$2,840	1.13	
Oct-17	Oct		\$ 2,712	\$2,877	0.93	
Nov-17	Nov		\$ 2,667	\$2,913	1.06	
Dec-17	Dec		\$ 2,808	\$2,947	0.97	
Jan-18	Jan			\$2,983	0.95	\$ 2,844.31
Feb-18	Feb			\$3,019	0.95	\$ 2,874.47
Mar-18	Mar			\$3,051	1.09	\$ 3,034.00
Apr-18	Apr			\$3,087	0.95	\$ 2,992.56
May-18	May			\$3,121	1.00	\$ 3,134.56
Jun-18	Jun			\$3,157	0.96	\$ 3,082.23
Jul-18	Jul			\$3,193	0.90	\$ 2,930.00
Aug-18	Aug			\$3,227	1.10	\$ 3,333.08
Sep-18	Sep			\$3,260	1.13	\$ 3,485.22
Oct-18	Oct			\$3,297	0.93	\$ 3,078.48
Nov-18	Nov			\$3,333	1.06	\$ 3,291.38
Dec-18	Dec			\$3,368	0.97	\$ 3,251.42

Time	24 month moving average	Seasonal index
Jul	\$2,366	0.90
Aug	\$2,399	1.10
Sep	\$2,431	1.13
Oct	\$2,464	0.93
Nov	\$2,498	1.06
Dec	\$2,530	0.97
Jan	\$2,569	0.95
Feb	\$2,599	0.90
Mar	\$2,629	1.09
Apr	\$2,657	0.95
May	\$2,689	1.00
Jun	\$2,721	0.96



This is the forecast chart.

The historical sales, annual growth trend, and the forecasted sale in the next 12 months are presented on the same chart.

The seasonal pattern is consistent, and a long term trend is very clear.

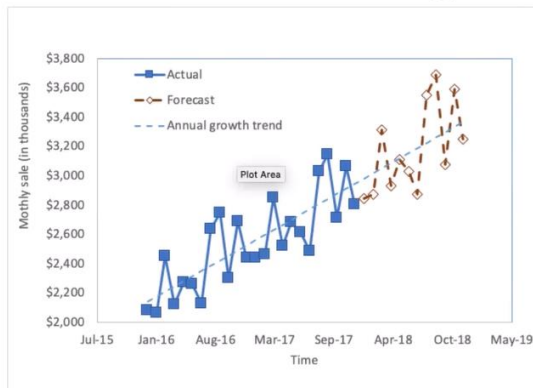
So, from the seasonal forecasting analysis, we can not only forecast the monthly sale in the next 12 months, but also can derive significant business insights from our forecasting analysis.

The long-term trend, which represents the annual growth rate, and the seasonal index, which represents our client's business decision making pattern.

All of these pieces of information can help you as a manager to optimize your business to maximize the profit of your product.

Slide #4

Business Forecasting & Communication



Insights:

- \$5m sale growth (15% upward trend) between 2017 and 2018
- Short-term: above average sales in March, August, September, and November, due to hospital purchasing schedule

Recommendations:

- Launch marketing campaign in Feb, July and October to maximize sale
- Ramp up production in 2H to optimize inventory and operation cash flow

Communication is a key element of forecasting.

Your communication should include not only the forecasted sale, but also business suggestions. I would like to share with you how I may communicate the sales forecast. First, I will present the forecast chart and the data, and then I will discuss business insights derived from the forecasting analysis.

For example, in the long term, 2018 annual growth target is 5 million, which is 50 percent higher than the 2017 revenue. The 5 million annual sale increase is consistent with the pace in the past two years. Also, I would expect in the short term average sales in March, August, September, and November will increase due to hospitals purchasing schedules.

Based on the business insight, I would make some recommendations to optimize the operations based on the short term sales pattern. For example, I recommend launch marketing campaign in February, July, and October to maximize sales. Also, I would recommend ramping up production in the second half of the year to optimize inventory and operations cash flow.