



# The Cost of Performance: Evolving the Capacity Planning Practice

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Southwest CMG  
February 21, 2018

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## What are we talking about?

**How can your Capacity Planning team become more of a valued partner to your business owners?**

**Topics:**

- Business value
- Terminology
- Idioms to help structure your thinking (Capacity Planning Stack)
- Examples & case study
- Recommendations on how to get started

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## How do you become a valued partner?

*Providing more "Business Value"*

### How can your Capacity Planning team become more of a valued partner to your business owners?

#### Key ingredients\* – Correlate cost to deliver to revenue gained:

- **Money** Money is the unit of measure for value.
- **Transaction** You cannot measure the business value of IT without a transaction.
- **Services** You cannot measure the business value of IT until you have explicitly defined what the IT organization is delivering (IT services) in a way that the consumer completely understands.

#### Reference°:

- "10 Truths for Measuring the Business Value of IT"
- Heather Pemberton Levy
- November 10, 2015
- <http://blogs.gartner.com/smarterwithgartner/author/hlevy>

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## Terminology

- **Business Service**
  - A recognizable set of economic services (stock trades, mortgages, bill pay, etc.)
  - A set of interconnected applications and logical/physical resources that are configured to offer a service to the organization
  - Supports a "service-aligned" view of IT
- **Business Service transaction (workload)**
  - Unit of work driving the Business Service
  - Natural Forecasting Unit (NFU)
- **Cost**
  - Dollars required to deliver the Business Service
  - Digital Infrastructure cost to process a Business Service transaction
- **Revenue**
  - Business' expected dollars generated from the Business Service
- **Capacity Planning Stack**

Correlate  
cost to deliver  
to  
revenue gained

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## The Capacity Planning Stack

*A structured way to think about & perform Capacity Planning*

↓ Volume & priorities

↓ Performance requirements & SLAs

↓ Resource footprint & Instances

↑ Cost

↑ Total time to satisfy

↑ Expected performance

**Capacity Planning Stack**

- Multi-level hierarchy
  - Demand (down)
  - Feedback (up)
- Supports all elements of today's Digital Infrastructure
- Implementation is straightforward & transparent

**Reference:**

- "Capacity Planning: A Revolutionary Approach for Tomorrow's Digital Infrastructure"
- Amy Spellmann & Richard Gimarc
- CMG 2013

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## Sample Business Service Measures & KPIs [1/4]

*Schwab - Workload Counts & Revenue per Trade*

Schwab Reduces Trade Commissions to \$4.95 and Lowers Per Contract Options Fee to \$0.65

Category: [Schwab Funds/Laudus Funds News](#), [Schwab Investor Services News](#)

Tuesday, February 28, 2017 6:26 am PST

Dateline: SAN FRANCISCO

Schwab	Fidelity	TD Ameritrade	E*Trade	Vanguard
\$4.95	\$4.95	\$9.99	\$9.99	\$7 - \$20 depending on number of trades

Clients' Daily Average Trades

Week of 10/09 – 10/13

Revenue trades	307,027
Asset-based trades	110,070
Other trades	125,012
<b>Total</b>	<b>524,109</b>

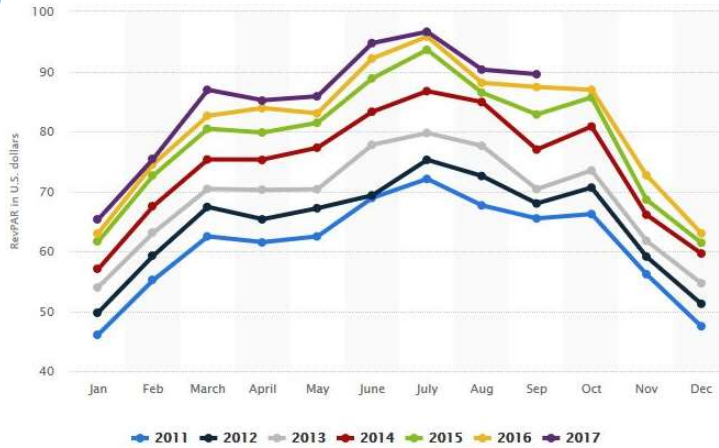
**Reference:**

- <http://pressroom.aboutschwab.com/press-release/schwab-fundslaudus-funds-news/schwab-reduces-trade-commissions-495-and-lowers-contract>
- <https://www.aboutschwab.com/investor-relations>

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## Sample Business Service Measures & KPIs [2/4]

### US Hotels - Revenue per Available Room



This statistic shows the monthly average revenue per available room of United States hotels from 2011 to 2017. In August 2017, the average revenue per available room for the U.S. hotel industry was 90.31 U.S. dollars.

- RevPAR
- Revenue Per Available Room
  - Avg daily room rate (ADR) x occupancy rate (0-100%)

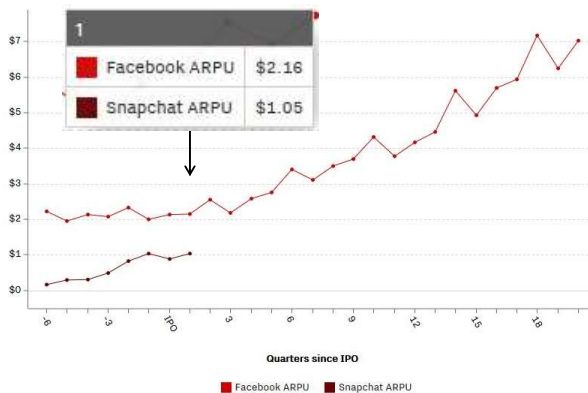
**Reference:**

- [www.statista.com/statistics/206515/us-hotel-revenue-per-available-room-by-month/](http://www.statista.com/statistics/206515/us-hotel-revenue-per-available-room-by-month/)

## Sample Business Service Measures & KPIs [3/4]

### Snap - Revenue per Active User

How Snapchat's average revenue per daily active user compares with Facebook



“... Snap believes it can grow its business by generating substantially more revenue from each of its existing users — a strategy that would mean sales go up even if its user base doesn't grow at the same rate.”


ARPU = Avg revenue [generated] per user

**Reference:**

- <https://www.recode.net/2017/8/7/16098798/snap-facebook-revenue-chart-growth-arpu-earnings>

## Sample Business Service Measures & KPIs [4/4]

Example – TPC-C Benchmark Results

		<b>Dell PowerEdge T620</b>		TPC-C Version 5.11 TPC Pricing 1.7.0
				Report Date November 24, 2014
<b>3</b> Total System Cost	<b>2</b> TPC-C Throughput	<b>4</b> Price/Performance		Availability Date
<b>\$21,160.12 USD</b>	<b>112,890 tpmC</b>	<b>\$0.19 USD/tpmC</b>		<b>24-Nov-2014</b>
Server Processors/cores/threads	Database Manager	Operating System	Other Software	Number of Users
2/20/40 Intel Xeon E5-2670 v2 2.5GHz	SQL Anywhere 16	Microsoft Windows 2012 Standard x64	Microsoft IIS Microsoft COM+ <b>1</b>	90,000

### Workload volume

- 1** Number of users
- 2** Throughput (tpmC)

### System cost

- 3** Total cost
- 4** Price/Performance

#### Reference:

- TPC Benchmark C - Executive Summary
- Benchmark Sponsor - SAP
- November 2014
- <http://www.tpc.org/1794>

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## We aren't the only ones talking about this [1/2]

*"Ultimately, IT only has value if it has value to the business."*  
- Lisa Kelly

*"It is important to measure not only the services that are used, but also the business results that come from their use."*  
- Chris Harding, The Open Group



#### Reference:

- "Understanding the real value of IT and proving it to the business"
- Lisa Kelly
- ComputerWeekly
- March 2014
- [www.computerweekly.com/feature/Understanding-the-real-value-of-IT-and-proving-it-to-the-business](http://www.computerweekly.com/feature/Understanding-the-real-value-of-IT-and-proving-it-to-the-business)

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## We aren't the only ones talking about this

[2/2]

*"It is important to develop a process/service alignment mapping in order to measure the cost of IT services as they relate to the business processes they enable."*

*"Unless you can accomplish this [value of IT services], your IT organization will forever be viewed as the cost center where technical stuff happens ..."*

**Reference:**

- "How to Measure and Improve the Business Value of IT Service"
- Phil Weinzimer
- IT Today
- February 2015
- [www.ittoday.info/ITPerformanceImprovement/Articles/2015-02Weinzimer.html](http://www.ittoday.info/ITPerformanceImprovement/Articles/2015-02Weinzimer.html)

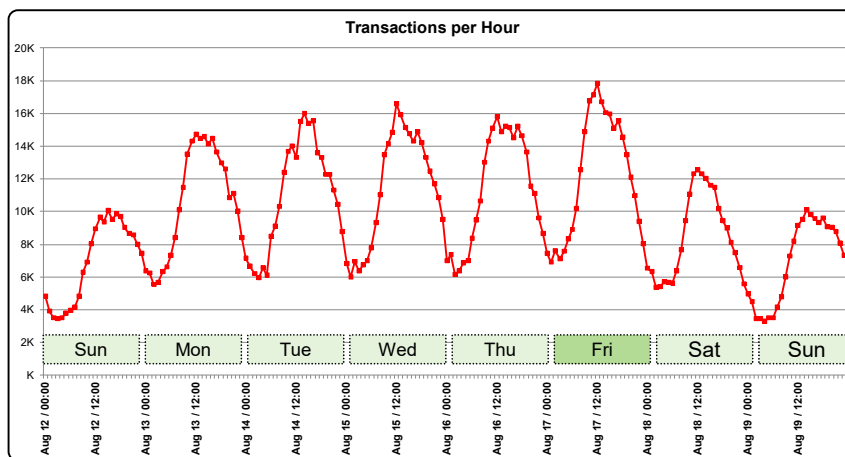


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## Business Service Arrival Pattern

[1/3]

*Financial Institution – Wire Fraud Detection*



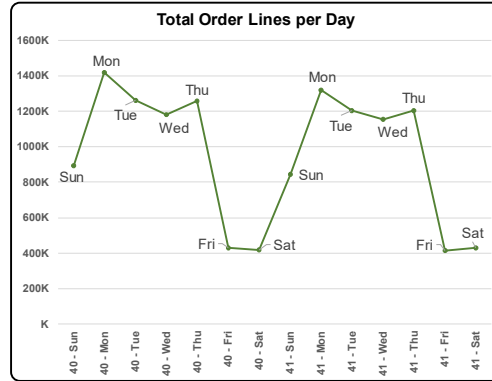
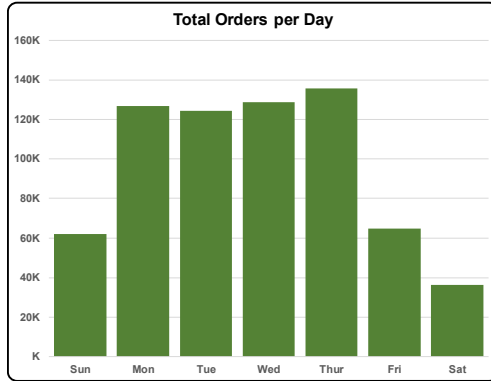
- Peak at noon
- Friday is peak day of the week

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## Business Service Arrival Pattern

[2/3]

*Pharmaceutical Distribution – Order-to-Cash*



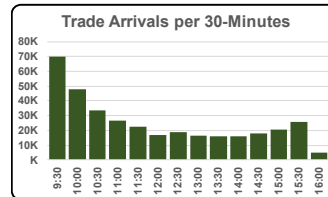
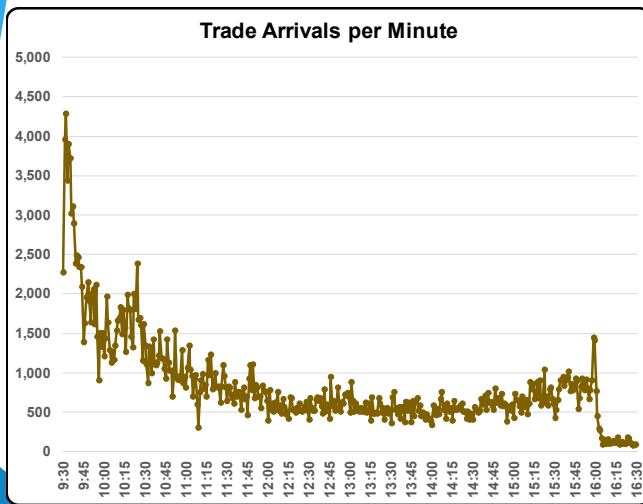
- One order may contain multiple order lines
- What is your planning metric?
  - Peak orders per day (Thursday)
  - Peak order lines per day (Monday)

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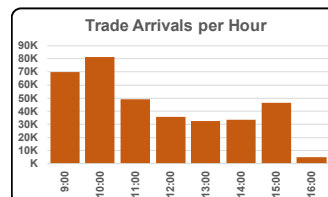
## Business Service Arrival Pattern

[3/3]

*Posting Stock Trades*



- Total per day: 353k
- Should your planning be based on
  - Daily total
  - Peak hour
  - Peak ½ hour
  - Peak minute



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## What needs to change? *Today vs. Tomorrow*

[1/2]

**Traditional Approach**

```

graph TD
    A[Collect infrastructure metrics] --> B[Map infrastructure components to Business Service]
    B --> C[Estimate infrastructure required for expected growth]
    C --> D[Prepare & send reports every quarter]
            
```

```

graph TD
    Business[Business] <--> Application[Application]
    Application <--> Infrastructure[Infrastructure]
    Infrastructure <--> Facilities[Facilities]
            
```

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## What needs to change? *Today vs. Tomorrow*

[2/2]

**Traditional Approach**

```

graph TD
    A[Collect infrastructure metrics] --> B[Map infrastructure components to Business Service]
    B --> C[Estimate infrastructure required for expected growth]
    C --> D[Prepare & send reports every quarter]
            
```

**Business Focused Approach**

```

graph TD
    A[Translate capacity planning results to NFUs] --> B[Determine cost to support NFU volume]
    B --> C[Correlate Business Service cost to expected revenue]
            
```

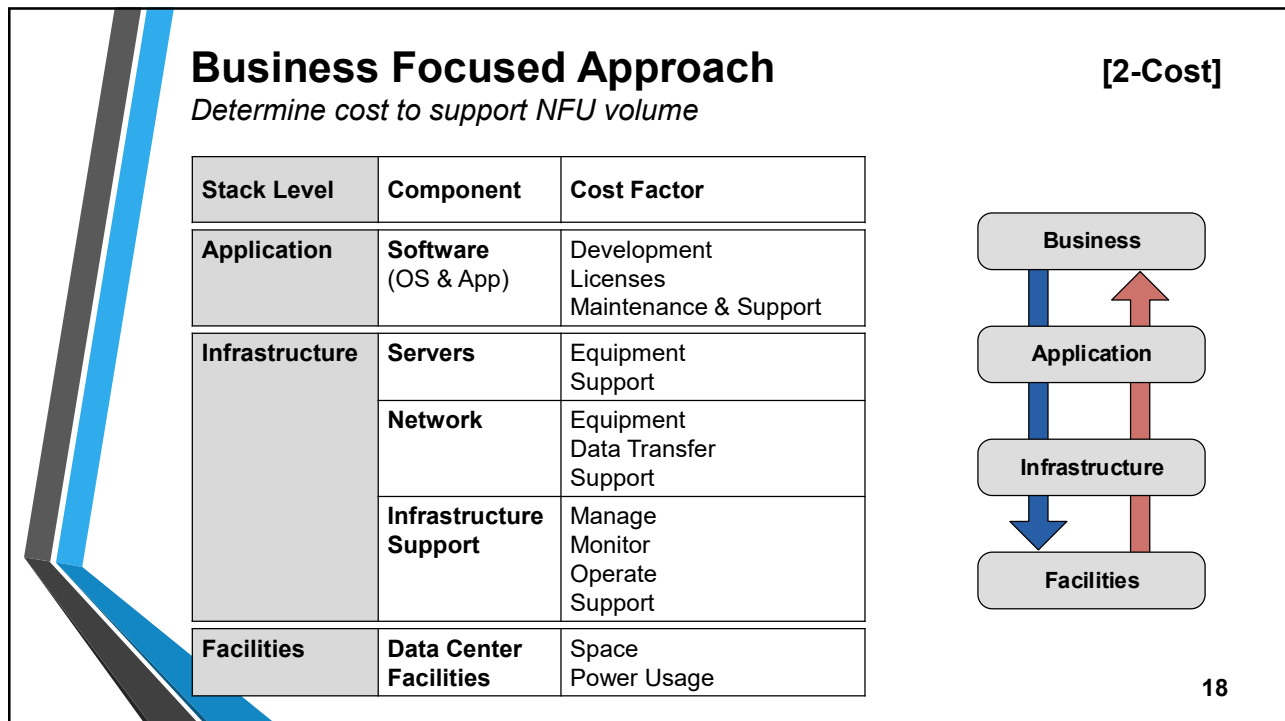
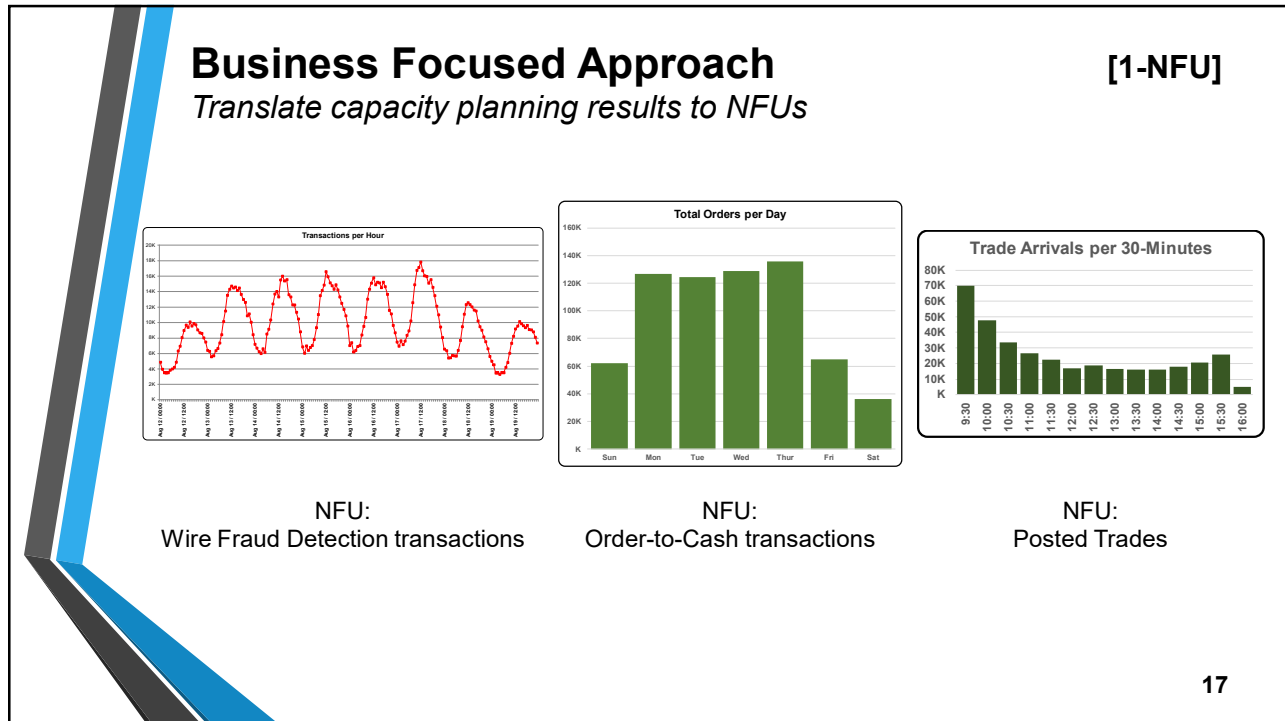
Correlate *cost to deliver* to *revenue gained*

```

graph TD
    Business[Business] <--> Application[Application]
    Application <--> Infrastructure[Infrastructure]
    Infrastructure <--> Facilities[Facilities]
            
```

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## Business Focused Approach [2-Cost]

*Costing resources*

- AWS Simple Monthly Calculator  
- <http://calculator.s3.amazonaws.com/index.html>
- AWS Total Cost of Ownership (TCO) Calculator  
- <https://awstcocalculator.com/>
- SoftLayer Total Cost of Ownership (TCO) Calculator  
- <http://www.softlayer.com/tco/?direct>
- Google Cloud Platform Pricing Calculator  
- <https://cloud.google.com/products/calculator/>
- Microsoft Azure Pricing Calculator  
- <https://azure.microsoft.com/en-us/pricing/calculator/>
- Unigma - Cloud Cost Comparison Calculator: AWS, Azure & Google Cloud  
- <https://calculator.unigma.com/>

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## Business Focused Approach [3-Revenue]

*Correlate Business Service cost to expected revenue*

**How do you get expected revenue per NFU?**

- Must come from the Business
- Business records and tracks revenue
- How do you get them to share?
- Correlation is how you become a valued partner to the Business (our goal)

Correlate cost to deliver to revenue gained

Schwab	Fidelity	TD Ameritrade
\$4.95	\$4.95	\$9.99

**How Snapchat's average revenue per daily active user compares with Facebook**

Quarters since IPO

■ Facebook ARPU ■ Snapchat ARPU

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## Case Study [1/4]

*Size & specify infrastructure for a new cloud-based application*

**Business Demand**

- Business is introducing a new cloud-based social media application
- Goal is to support 10,000 daily active users
- Expected revenue is \$1.25 per daily active user

**Capacity Planning Tasks**

- Determine infrastructure required to support 10k users
- Provide cost feedback to the Business

**Assumptions**

- Use AWS to host the application
- Stack: Business ↔ Application ↔ Infrastructure

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## Case Study [2/4]

*Application Planners – develop infrastructure requirements*

1) **Application Planners** develop infrastructure requirements

Tier	Instances	Type	vCPU	GB Memory
Web	40	Linux on t2.xlarge	4	16
App	10	Linux on t2.2xlarge	8	32
DB	1	Linux on d2.4xlarge	16	122

Tier	Volumes	Volume Type	Storage GB
User Data	40	Throughput Optimized HDD	4

**Next step** – Forward demand to Infrastructure Planners

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## Case Study

[3/4]

*Business feedback – “Can we do better on cost?”*

### 4) Infrastructure Planners change to “3 Yr Partial” pricing

AWS per Mth	Workload (Users)	Billing Option	AWS per Qtr	AWS per user Per Qtr	Expected Revenue per User per Qtr	Expected Revenue per Qtr	Revenue-Cost per Quarter
\$10,952	10k	On-Demand	\$32,857	\$3.29	\$1.25	\$12,500	<b>-\$20,357</b>
\$3,988	10k	1 Yr Partial Upfront Reserved	\$11,964	\$1.20	\$1.25	\$12,500	\$536
\$2,921	10k	3 Yr Partial Upfront Reserved	\$8,763	<b>\$0.88</b>	<b>\$1.25</b>	\$12,500	<b>\$3,736</b>

**Next step** – Looks much better – feedback to Business owner

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## Case Study

[4/4]

*Final Result*

### Business Demand

- Business is introducing a new cloud-based social media application
- Goal is to support 10,000 daily active users
- Expected revenue is \$1.25 per daily active user

### Capacity Planning Tasks

- Determine infrastructure required to support 10k users
- Select a billing option (cost) that satisfies the Business requirements

AWS per Mth	Workload (Users)	Billing Option	AWS per Qtr	AWS per user Per Qtr	Expected Revenue per User per Qtr	Expected Revenue per Qtr	Revenue-Cost per Quarter
\$2,921	10k	3 Yr Partial Upfront Reserved	\$8,763	<b>\$0.88</b>	<b>\$1.25</b>	\$12,500	<b>\$3,736</b>

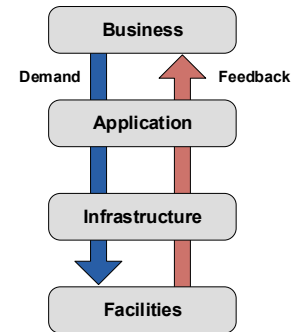
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## Wrap-up & Recommendations

[1/2]

**How can your capacity planning team become more of a valued partner to your business owners?**

- **Expand Capacity Planning practice to include**
  - Business Service aligned view
  - NFU
  - Cost of Digital Infrastructure per NFU
  - Revenue per NFU
- **Enhance relationship with business owner**
  - Build a working relationship with business owner
  - Demonstrate that you can speak their language
  - Conduct regular updates from your Capacity Planning team



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## Wrap-up & Recommendations

[2/2]

**“Counting is easy; measuring value is hard.”**

*“People count quantities (easy) rather than measure importance (hard) and as a result sometimes make faulty decisions.”*

- Perfect attendance award vs. whether you learned anything in school
- Billable hours (e.g., lawyers) vs. quality of their work
- Basketball – number of blocked shots vs. value of a blocked shot

**We know how to count, next steps are**

- Correlating cost to revenue gained
- Communicating with the Business

**Reference:**

- "Scorecasting: The Hidden Influences Behind How Sports Are Played and Games Are Won"
- Tobias Moskowitz & L. Jon Wertheim
- 2011

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