

# Establishing Quantitative Economic Value for Product & Service Features: A Method for Customer Case Studies

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```
nWindowState = START_WINDOW;  
DisableDIRQ();  
nRevCounter++;  
nLEDTurn = 0;  
SetGain( 1 );  
ControlLED( DARK, OFF );  
  
if ( nRevCounter > 0 ) <  
  dirQPosition += ( ENCODER_RES - nWindowEnd + nWindowStart  
  ms629_setba( dirQPosition );  
  
else < // END OF TEST  
  DisableMotorIRQ();  
  ms629_ResetIRQMask( BRKPTPOS );  
  
nDataLength = (int)( (long)pTempData - (long)&TempBuffer[0] );  
nDataLength >>= 4; // Data length in paragraphs  
TempBuffer += (UInt8)nDataLength; // Copy length to output buffer  
ControlLED( DARK, OFF );  
TempCounter = TempBuffer; nDataLength = 0;  
TempCounter += nDataLength;  
TempCounter = In629_readba();  
TempCounter = (UInt8)nReadVelocity;  
TempCounter = (UInt8)nReadVelocity >> 8);  
for new  
  *pAddDataBuffer++ =  
>  
break;  
default:  
break;
```

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# Value

- Why do customers buy products which are not the lowest price?

```
nWindowState = START_WINDOW;
DisableDIRQ();
nRevCounter--;
nLEDTurn = 0;

SetGain( 1 );
ControlLED( DARK, OFF );

if ( nRevCounter > 0 ) {
  dirQPosition += ( ENCODER_RES - nWindowEnd + nWindowStart );
  In629_sethqa( dirQPosition );
}
else { // END OF TEST
  DisableMotorIRQ();
  In629_ResetIRQMask( BRKPTPOS );
}

nDataLength = (int)( (long)pTempData - (long)&aTempBuffer[0] );
nDataLength >>= 4; // Data length in paragraphs
pOutDataBuffer += (UInt8)nDataLength; // Copy length to output buffer
nDataLength <<= 4; // Data length in bytes again
memcpy( pOutDataBuffer, aTempBuffer, nDataLength );

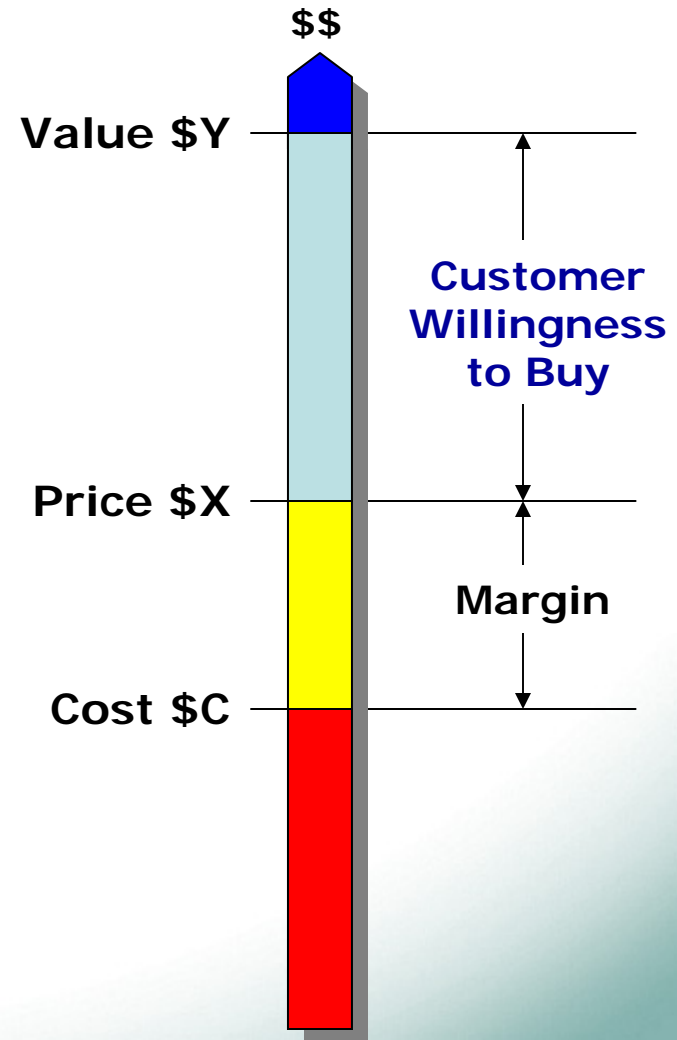
pOutDataBuffer += nDataLength;
nHeadVelocity = In629_readvel();
nHeadVelocity += (UInt8)(nHeadVelocity);
nHeadVelocity += (UInt8)(nHeadVelocity >> 8);
for new velocity
pOutDataBuffer += nDataLength;
break;
default:
break;
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```

# Value is What the Customer Gets After Buying

- Value is expressed in dollars
- Value is the worth of the benefits that a customer receives after it pays for a product.

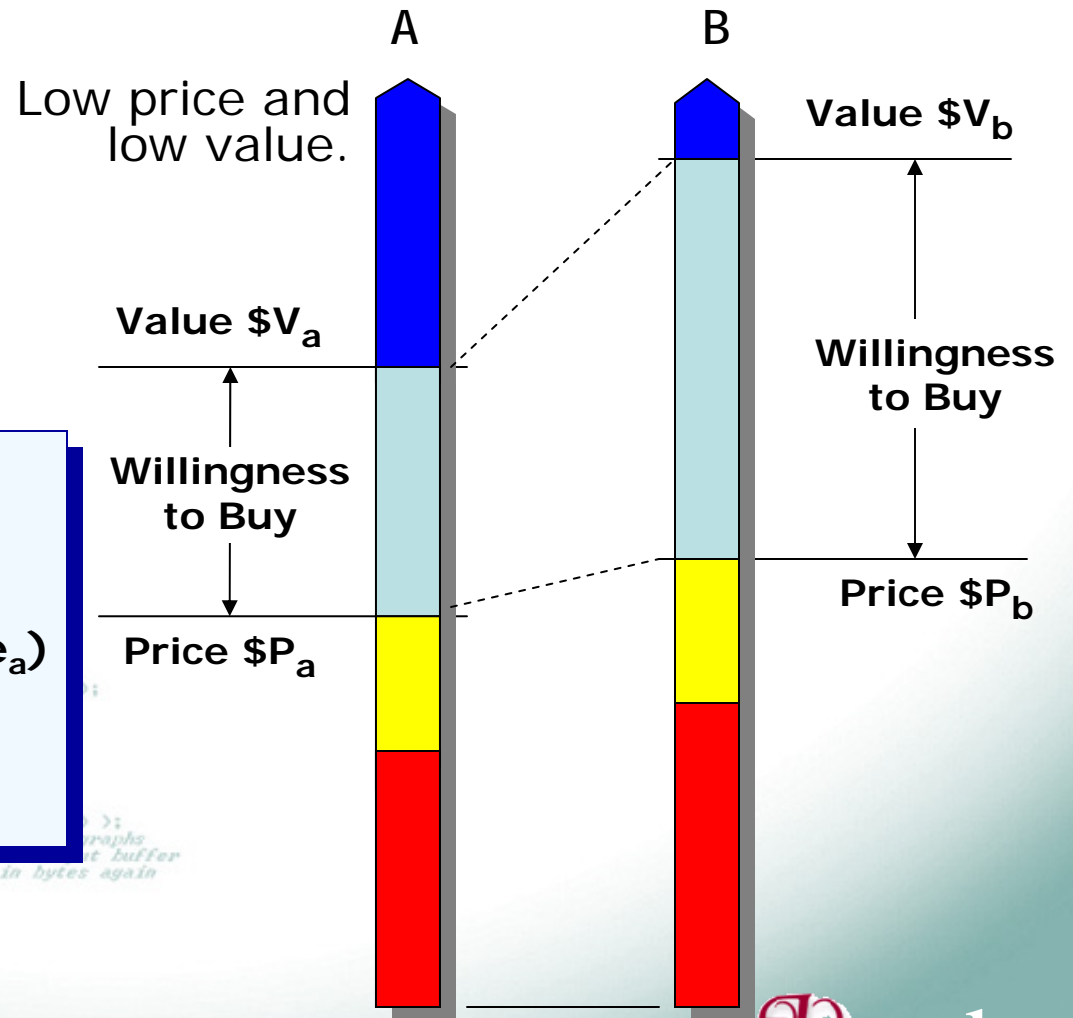
## FACTS:

- When Value > Price, then there is a willingness to buy,
- Value does not change, even when price is raised or lowered.



# Importance of Willingness-to-Buy

Higher price and higher value.



## The Basic Concept

When

$$(\text{Value}_b - \text{Price}_b) > (\text{Value}_a - \text{Price}_a)$$

The customer will prefer b,  
even if  $\text{Price}_b > \text{Price}_a$ .

## Example: Caterpillar Tractors

Adapted from Kotler, Anderson, Narus, 1999.

### RELATIVE PRICE

- Caterpillar
- Competitor

\$130,000

\$100,000

---

\$30,000

### RELATIVE VALUE

- Longer Usage [Durability]
- Less Maintenance [Quality]
- Less Downtime [Superior Service]
- Fewer Replacements [Superior Parts]

\$15,000

\$10,000

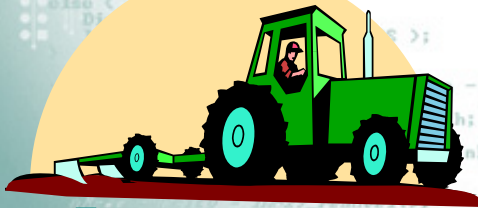
\$10,000

\$5,000

---

\$40,000

Which is why Caterpillar is the #1 supplier, even with a higher price.



# How Do You Determine Value?

- Traditional answer used: a **Benefit Statement** document

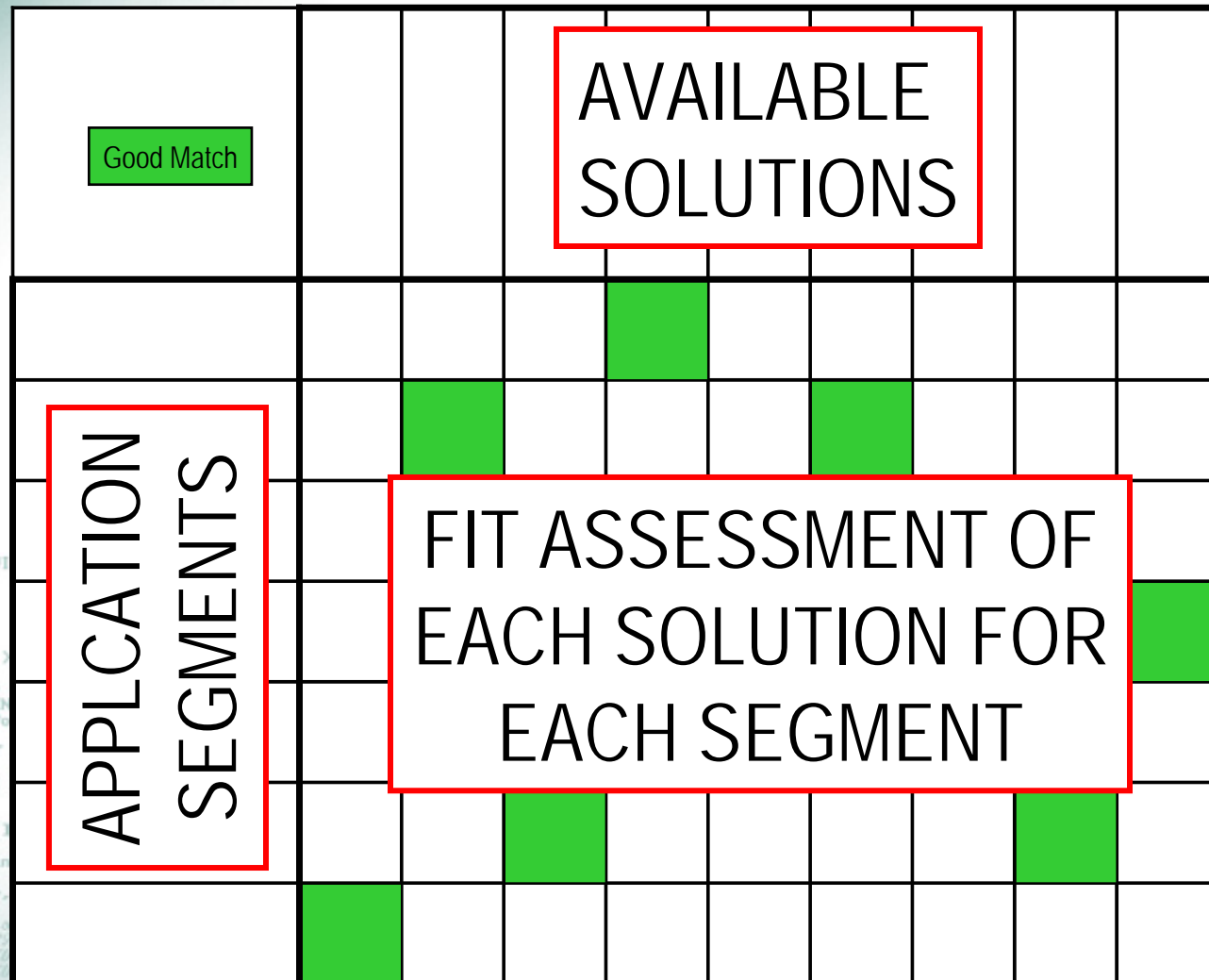
- For whom?

What applications or markets segments should you focus on?  
Particularly with new technologies.

- Of what?

What features or performance levels should you focus on?  
Particularly with new technologies.

# To Determine What Application-Segments to Focus on, You Need the Following Data



## Example: New Technology to Generate Humidification

- Fortune 1000 corporation conducted a R&D project that resulted in new technology for creating humidification
- Several unrelated customers expressed interest
  - 3 – Greenhouses
  - Electronics
- Each requires large investment to bring to profitability
- Which should be invested in?
- What if they missed a better one?
- How do you filter potential opportunities?



# Your New Technology: What are the Functions Delivered?

- Humidification
- Cooling
- Dust Control
- Odor Control



**NOW GO WEB SEARCH THESE FUNCTIONS**

# What You Uncover: Other Technologies, Other Application Segments, Other Benefits

## Process Heating

FOR MANUFACTURING ENGINEERS WHO USE HEAT PROCESSING EQUIPMENT AND SUPPLIES

### Industrial Dryers Market Profile Study

**PROCESS SENSORS CORPORATION** World Leader in Accurate Near Infrared Technology

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#### Applications

Listed below you will see a few of Process Sensor's application segments. If you do not see your application listed here, please contact us.

Animal Food Products

- Fish Meals
- Grass, Alfalfa, etc.
- Soya Meals
- Hard Pet Foods
- Beet Pulp
- Spent Brewer's Grains
- Soft Pet Foods

Chemicals

- Calcium Carbonate
- Fertilizer Pellets
- Powders
- Plastic Granules/Pellets
- Soap Noodles
- Detergent Powders
- PVC Powders
- Crumb Rubber
- Soap Powders/Flakes

Human Food Products

- Finished Cereals
- Crackers
- Roast and Ground Coffee
- Tea
- In Process Cereal Products
- Cookies
- Instant Coffee
- Soya Products



# “Humidification Function” Searching: Uncovered Other Possible Applications

- Commercial Ducted Humidity Only
- Commercial Ducted Cooling Only
- Commercial Open Space Humidity Only
- Commercial Open Space Cooling Only
- Industrial Animal Food Products
- Industrial Chemicals
- Industrial Human Food Products
- Industrial Mining and Minerals
- Industrial Paper, Film & Converting
- Industrial Textiles
- Industrial Plastics (non-web)
- Industrial Tobacco
- Industrial Wood Products
- Industrial Electronics
- Industrial Medical Devices
- Industrial Cement and Aggregate
- Industrial Paint Shop
- Industrial Waste Management
- Agriculture Greenhouses
- Agriculture Livestock

Uncovered through web searches and market research reports, searching for humidification uses and businesses.

Different applications value different benefits from humidification.

## “Humidification Function” Searching: Uncovered Other Valued Benefits

- Humidification
- Cooling
- Dust Control
- Electrostatic Control
- Lubrication
- Odor Control
- Droplet Distribution
- No Surface Wetting
- No Contaminants
- No Bacteria
- Regulatory Approved
- Low Space Requirements
- Low Total Cost of Operation
- Low Installation Cost
- High Reliability
- High Robustness to Abuse
- Low Noise and Vibrations

Our solution as currently configured may or may not provide these benefits well. But at least one application-segment wants this benefit.

# “Humidification Function” Searching: Uncovered Other Possible Competitive Solutions

- ◆ Steam Boilers
- ◆ Drip Water
- ◆ Water Sprayers
- ◆ Pressurized Water Foggers
- ◆ Ultrasonic water Foggers
- ◆ Pneumatic Water Foggers
- ◆ Centrifugal Humidifiers
- ◆ Ionizing Guns
- ◆ Discharge Plates
- ◆ Vacuum Systems
- ◆ Recirculating Filters

```
nWindowState = TARR;
DisableDCIRQ;
nRevCounter--;
nLEDTurn = 0;

SetGain( 1 );
ControlLED( DARK, OFF );

if ( nRevCounter > 0 ) {
  dirQPosition += ( nRevCounter * nWindowStart );
  In629_SetDirQ( dirQPosition );
}
else { // END OF TEST
  DisableMotorIRQ();
  In629_ResetIRQMask( BRKPTPOS );
}

nDataLength = (int)( (long)pTempData - (long)&aTempBuffer[0] );
nDataLength >>= 4; // Data length in paragraphs
nDataBuffer++ = (uint8)nDataLength; // Copy length to output buffer
nDataLength <<= 4; // Data length in bytes again
memcpy( pOutDataBuffer, aTempBuffer, nDataLength );
```



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pdma

# Now We've Structured the Matrix

	Steam Boilers	Drip Water	Water Sprayers	Pressure Water	Ultra Water	P Water	Cer Humidifier	Ionizing Gun	Charge Plates	Vacuum System	Recirculating Filters
Commercial Humidity Only											
Commercial Cooling Only											
Industrial Animal Food Products											
Industrial Human Food Products											
Industrial Mining and M...											
Industrial Paper											
Industrial Textiles											
Industrial Plastics (non-web)											
Industrial Tobacco											
Industrial Wood Products											
Industrial Electronics											
Industrial Medical Devices											
Industrial Cement and Aggregate											
Industrial Paint Shop											

Competitive Solutions

Application Segments

How can you get unbiased assessments of which solutions are better suited to each application?

# Accurate Assessments of Solutions

- Asking directly for an assessment of how a technology will meet an application *will be biased*
  - NIH: “That won’t work here, nobody uses it”
  - “We are talking to a customer in Application Segment X”
  - “We don’t know anyone in Application Segment Y”

- It does not work...

- You need to de-couple the assessment

– HOW: USE THE BENEFITS (Customer Needs)!

# Step 1: Segment-Applications to Benefits Matrix

	Humidification	Cooling	Moisturizing	Dust Control	Electrostatic Control	Dimensional Control	Lubrication	Odor Control
Commercial AHS Humidity Only	1	0	0	0	1	0	0	0
Commercial AHS Cooling Only	0	1	0	0	0	0	0	0
Commercial Open Space Humidity Only	1	0	1	0	1	0	0	0
Commercial Open Space Cooling Only	0	1	0	0	0	0	0	0
Industrial Animal Food Products	0	0	1	0	0	0	0	0
Industrial Chemicals	1	0	1	0	0	0	0	0
Industrial Humidity	1	1	1	0	0	0	0	0
Industrial Converting	1	0	1	0	0	0	0	0
Industrial Plastics (non-web)	0	0	1	0	0	0	0	0
Industrial Tobacco	1	0	1	0	0	0	0	0
Industrial Wood Products	1	0	1	0	0	0	0	0
Industrial Electronics	0	0	0	0	0	0	0	0
Industrial Medical Devices	0	0	0	0	0	0	0	0
Industrial Cement and Aggregate	0	0	0	1	0	1	0	0
Industrial Paint Shop	0	0	0	1	1	0	0	0
Industrial Waste Management	0	0	0	1	0	0	0	1
Agriculture Greenhouses	1	1	0	0	0	0	0	0
Agriculture Livestock	0	1	0	1	0	0	0	1

Benefits Desired

Application Segments

Matrix rating: What benefits (customer needs) does the application want?

```

nWindowState = START_WINDOW;
DisableDCIRQ();
nRevCounter++;
nLEDTurn = 0;

SetGain( 1 );
ControlLED( DARK, OFF );

if ( nRevCounter > 0 ) {
  dirQPosition += ( ENCODER_
  In629_sethja( dirQPosition

...
// END OF TEST
DisableMotorIRQ();
In629_ResetIRQMask( BRKPTPOS );

...
nDataLength = (int)( (long)pTempData
nDataLength >>= 4;
pTempDataBuffer += (UInt8)nDataLength
nDataLength <<= 4;
pTempDataBuffer, aTempBuffer,

...
pTempDataBuffer += nDataLength;
pTempDataBuffer = In629_readoe1();
pTempDataBuffer += (UInt8)nReadWeL
pTempDataBuffer += (UInt8)nReadWeL
    
```



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## Step 2: Benefits to Competitive Solutions Matrix

	Steam	LP Water Drip	LP Water Spray (Tap Water)	LP Water Spray (Tech Water)	HP Water Fog (w/oil lube) (Tap Water)	HP Water Fog (w/oil lube) (Tech Water)	HP Water Fog (only) (Tap Water)	HP Water Fog (only) (Tech Water)	Ultrasonic Water (Tap Water)	Ultrasonic Water (Tech Water)	Pneumatic Water Fog (Tap Water)	Pneumatic Water Fog (Tech Water)	Centrifugal Humidifier (Tap Water)	Centrifugal Humidifier (Tech Water)	Ionizing Guns	Discharge Plates	Vacuum System	Recirculating Filter
Humidification	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Cooling	0	1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0
Moisturizing	1	1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0
Decontamination	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1
Temperature Control	1	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0
Lubrication	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
Odor Control	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0

Benefits Provided

Competitive Solutions

Matrix rating: How capable is each solution at each benefit?

## Step 3: Matrix Multiplication: Assessments of Solutions for Each Application

Good Match  
Some Match

Competitive Solutions

Application Segments

	Steam	LP Water Drip	LP Water Spray (Tap Water)	LP Water Spray (Tech Water)	HP Water (w/oil lube) (Tap Water)	HP Water (oil lube) (Tech Water)	HP Water (only) (Tap Water)	Pressurized Water
Commercial AHS Humidity Only	0.2	0.2			0.2	0.2	0.2	0.2
Commercial AHS Cooling Only		0.5			0.1	0.1	0.1	0.1
Commercial Open Space Humidity Only	0.5	0.5			0.3	0.3	0.3	0.3
Commercial Open Space Cooling Only		0.5			0.1	0.1	0.1	0.1
Industrial Animal Food Products	0.5	0.5			0.1	0.1	0.1	0.1
Industrial Chemicals	0.5	0.5	0.0	0.0	0.3	0.3	0.3	0.3
Industrial Food Products	0.5	1.0			0.3	0.3	0.3	0.3
Industrial Machinery & Converting	0.6	0.2			0.4	0.4	0.4	0.4
Industrial Textiles	0.6	0.2						
Industrial Plastics (non-web)		0.0	0.0	0.0				
Industrial Tobacco	0.8	0.3						
Industrial Wood Products	0.3	0.3	0.3	0.3				
Industrial Electronics								
Industrial Medical Devices								
Industrial Cement and Aggregate	0.2		0.2	0.2				
Industrial Paint Shop			0.2	0.2	0.2	0.2	0.2	0.2
Industrial Waste Management			0.8	0.8	0.2	0.2	0.2	0.2
Agriculture Greenhouses	0.2	0.8			0.2	0.2	0.2	0.2
Agriculture Livestock		0.0	0.5	0.5	0.3	0.3	0.3	0.3

Matrix rating: Which solution will sell to which application-segment?

# How Do You Determine Value?

- Traditional answer used: a **Benefit Statement** document



For whom?

What applications or markets segments should we focus on?  
Particularly with new technologies.

- Of what?

What features or performance levels should we focus on?  
Particularly with new technologies.



## Example: Fortune 500 Telecommunications Equipment Manufacturer

- Manufacturer of network and telephone communication equipment

Question: What can they do to provide to their application-segments, to sell on value?

- Problems...

– Now a commodity market

– Losing marketshare



## Example Application-Segment: Retail Pharmacy



- Fortune 500 retail pharmacy retailer

- Stores: 4,217

- Sales: \$2.2B

- COGS: 1.26B

- SOGS: 1.26B

- COGS: 1.26B

- SOGS: 1.26B

- COGS: 1.26B

- SOGS: 1.26B

- COGS: 1.26B

- SOGS: 1.26B

- COGS: 1.26B

- SOGS: 1.26B

- COGS: 1.26B

Question: What does this application-segment want of their telecommunication systems, and how can our manufacturer determine what new features to incorporate in their equipment to command a price premium?

- Upgrades: T1 rollout underway

IQ  
cards

# Process for Determining Value-Pricing Features

- Map the customer's process
  - What are the activities?
  - What are the technologies employed?
  - What are the kludges used to make it all work for them?
- Ask where are the pains?
  - What is hard to do?
  - What are the costs of each step?
- For each pain, ask what your solution can do to solve it
  - Generate new concepts
  - Find new white-space combinations of your solution with other technologies used by the customer in their work.



## Retail Pharmacy: In-store Pains & Benefits

VOC: Pain	Our Technology's Benefit
Electronic transaction hardware down	Speed and reliability of transaction approval
Electronic transaction software buggy	Security of transaction approval
Manager not accessible during crisis at register	Speed of managerial access
Checkout delayed and customers walk	Reliability of connection with checkout
Lines too long and customers walk during peak season	Ease of peak season expansion

# Retail Pharmacy: Corporate Procurement



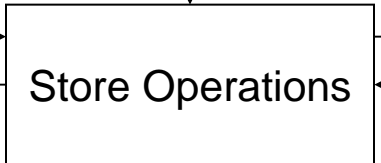
```

nWindowState = START_WINDOW;
DisablePDCIRQ();
nRevCounter--;
nLEDTurn = 0;

SetGain( 1 );
ControlLED( DARK, OFF );

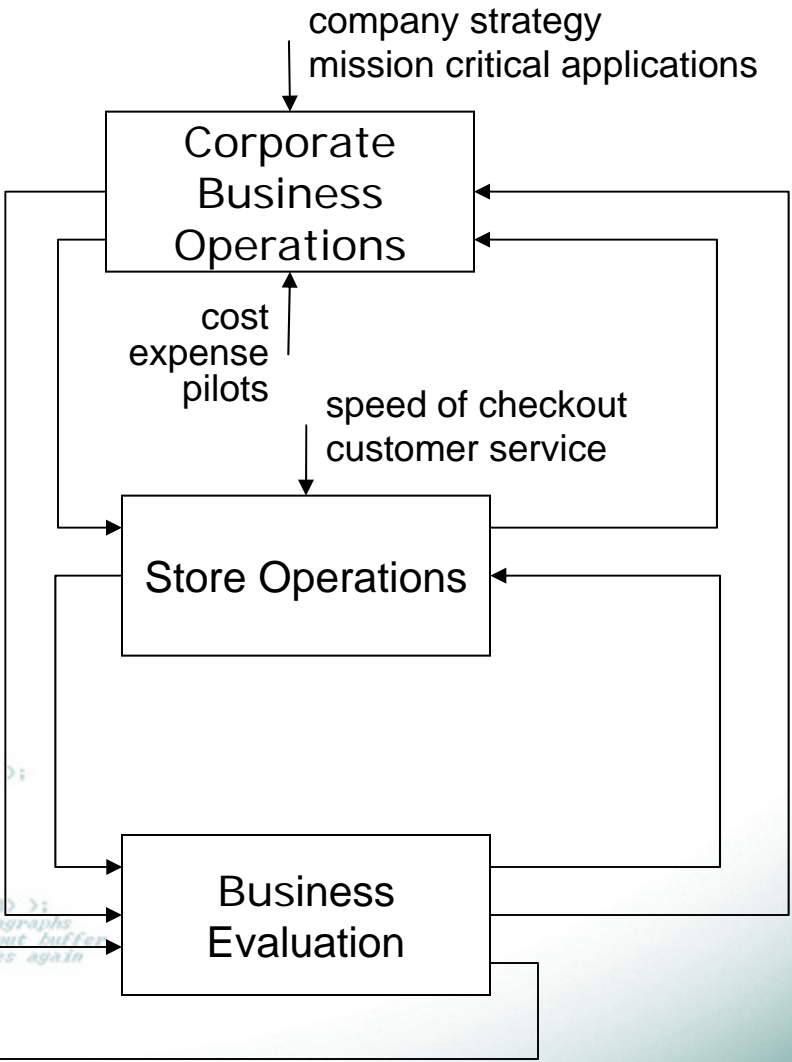
if ( nRevCounter > 0 ) {
  dirQPosition += ( ENCODER_RES - nWindowEnd + nWindowStart );
  In629_sethqa( dirQPosition );
}
else { // END OF TEST
  DisableMotorIRQ();
  In629_ResetIRQMask( 0 );
}
    
```

sales calls  
RFP



company strategy  
mission critical applications

cost  
expense  
pilots  
speed of checkout  
customer service



# Corporate Benefits

VOC: Pain	Our Technology's Benefit
Nightly transaction totals not delivered due to hardware failure	Reliability of nightly bank transfers
Nightly transaction totals not delivered due to software bug	Security of nightly bank transfers
Goods ordering fails	Reliability of connection with orders
Non-CVS goods ordering fails	Ease of establishing connection with vendors on heterogeneous systems



## Benefit: Speed of Transaction Approval

This benefit is the added revenue a store can expect with less downtime of the checkout-to-bank approval communication due to equipment failure.

$$\text{Added Revenue} = CNf_1f_2(r_2 - r_1)$$

$C$ Average customer transaction	dollars	\$9.00
$N$ Number of customer transactions per year	count	600,000
$f_1$ Fraction of customers paying via e-payment	percent	40%
$r_2$ System reliability of bank-to-checkout using Avaya equipment	percent	99.999%
$r_1$ System reliability of bank-to-checkout using non-Avaya equipment	percent	99.919%
$f_2$ Fraction of customers paying via e-payment who walk when a difficulty occurs	percent	5%
		<b>\$86</b>

$$\text{Reduced Expense} = nRt$$

$n$ Number of failures per year	count	2
$R$ Labor rate	\$/hr	\$19.00
$t$ Time to deal with each failure	hr	6
		<b>\$228</b>

**Client Value of Avaya Solution: \$314**

## Benefit: Reliability of Connection with Orders

This benefit is the added revenue a store can expect with less out-of-stock conditions due to ordering equipment communication failures.

$$\text{Added Revenue} = CNfSr_2r_1$$

$C$ Average customer transaction	dollars	\$9.00
$N$ Number of customer transactions per year	count	600,000
$S$ Percent that is out of stock	percent	0.3%
$r_2$ System reliability of bank-to-checkout using Avaya equipment	percent	99.999%
$r_1$ System reliability of bank-to-checkout using non-Avaya equipment	percent	99.919%
		<b>\$0</b>

$$\text{Reduced Expense} = 0 \text{ } r_2e = 0$$

**Client Value of Our Solution: \$0**

```

nWindowState = START_WINDOW
DisableDIRQ();
nRevCounter--;
nLEDTurn = 0;

SetGain( 1 );
ControlLED( DARK, OFF );

if ( nRevCounter > 0 ) {
    dirQPosition += ( ENCODER_RES - nWindowEnd + nWindowStart );
    In629_sethqa( dirQPosition );
}
else { // END OF TEST
    DisableMotorIRQ();
    In629_ResetIRQMask( BRKPTPOS );
}

DataLength = (int)( (long)pTempData - (long)&aTempBuffer[0] );
DataLength >>= 4; // Data length in paragraphs
pDataBuffer++ = (UInt8)nDataLength; // Copy length to output buffer
DataLength <<= 4; // Data length in bytes again
memcpy( pDataBuffer, aTempBuffer, nDataLength );

pDataBuffer += nDataLength;
nDataLength = In629_readvel();
nDataLength += (UInt8)(nHeadVelocity);
nDataLength += (UInt8)(nHeadVelocity >> 8);
    
```

## Benefit: Nightly Bank Transfers Reliability

This benefit is the added revenue a store can expect with less downtime of the backoffice-to-bank nightly totals deposit/receipt communication due to equipment failure.

$$\text{Added Revenue} = CNfR (r_2 - r_1)$$

$C$ Average customer transaction	dollars	\$9.00
$N$ Number of customer transactions per year	count	600,000
$f$ Fraction of customers paying via e-payment	percent	40%
$R$ Prime Rate	percent	4%
$r_2$ System reliability of bank-to-checkout using Avaya equipment	percent	99.999%
$r_1$ System reliability of bank-to-checkout using non-Avaya equipment	percent	99.919%
		<b>\$69</b>

$$\text{Reduced Expense} = nRt$$

$n$ Number of failures per year	count	0.33
$R$ Labor rate	\$/hr	\$60.00
$t$ Time to deal with each failure	hr	6
		<b>\$120</b>

$$\text{Reduced Telecom Expense} = 0$$

**Client Value of Our Solution: \$189**

## Benefit: Speed of Managerial Access

This benefit is the added revenue a store can expect with increased sales that would have been lost due to a manager not providing a checkout person with required information in time, before the customer says forget it.

$$\text{Added Revenue} = CNf_1f_2f_3$$

$C$	Average customer transaction	dollars	<b>\$7.00</b>
$N$	Number of customer transactions per year	count	<b>600,000</b>
$f_1$	Fraction of customer transactions requiring a supervisor	percent	<b>1%</b>
$f_2$	Fraction of $f_1$ not processed because the supervisor didn't show in time	percent	<b>25%</b>
$f_3$	Fraction of $f_2$ that is processed because Avaya equipment speeded supervisor access	percent	<b>10%</b>
			<b>\$1,565</b>

$$\text{Reduced Expense} = 0$$

**Client Value of Our Solution: \$1,565**

# Summary

- You must compare your solution's value against competitive solutions, a benefit statement in isolation is misleading
- You should focus on application segments where your solution delivers higher value than competitive solutions
- Value to a customer can be easily determined by examining where your solution delivers value to their process
- Quantifying this value can make clear any competitive advantage and price flexibility

```
nWindowState = START;
DisableDIRQ();
nRevCounter--;
nLEDTurn = 0;

SetGain( 1 );
ControlLED( DARK, OFF );

if ( nRevCounter > 0 ) {
    dirQPosition += ( ENCODER_RES - nWindowEnd + nWindowStart );
    In629_sethqa( dirQPosition );
}
else { // END OF TEST
    DisableMotorIRQ();
    In629_ResetIRQMask( BRKPTPOS );
}

nDataLength = (int)( (long)pTempData - (long)&aTempBuffer[0] );
nDataLength >>= 4; // Data length in paragraphs
pDataBuffer++ = (UInt8)nDataLength; // Copy length to output buffer
nDataLength <<= 4; // Data length in bytes again
memcpy( pDataBuffer, aTempBuffer, nDataLength );

pDataBuffer += nDataLength;
nHeadVelocity = In629_readvel();
nHeadVelocity += (UInt8)(nHeadVelocity);
nHeadVelocity += (UInt8)(nHeadVelocity >> 8);
```

