

Smart Grid Technology: Issues small manufacturers will face

By David Sorensen, P.E. & WestCAMP CEO
The Western Center for Advanced Manufacturing Programs

Three Questions to Address

- 1 - How do Smart Grid technologies and innovations relate to Manufacturing?
- 2 – What challenges do small manufacturers encounter when they incorporate new technologies and innovations into products?
- 3 – What can we do to help manufacturers improve their likelihood for success.

SMART GRID

- ◆ Smart Grid is a system intended to enable the stable supply and efficient usage of electrical power. The latest technologies will be used to give "intelligent" functions to the entire power distribution grid, making it a "smart" grid capable of reducing emissions, balancing consumer loads and boosting energy efficiency.

Smart Grid Electricity Infrastructure



These are all Products (Finished Goods)

Products are Produced by Manufacturers

- ◆ Distributed Generation & Storage
- ◆ Advanced metering
- ◆ Plug-in Hybrids
- ◆ Efficient building systems
- ◆ Smart end use devices
- ◆ Utility Communications
- ◆ Dynamic system control
- ◆ Control interfaces
- ◆ Renewable energy generation

What must Smart Grid have first and foremost?

Products ...

...and who produces products?

Manufacturers!

What is a Manufacturer?

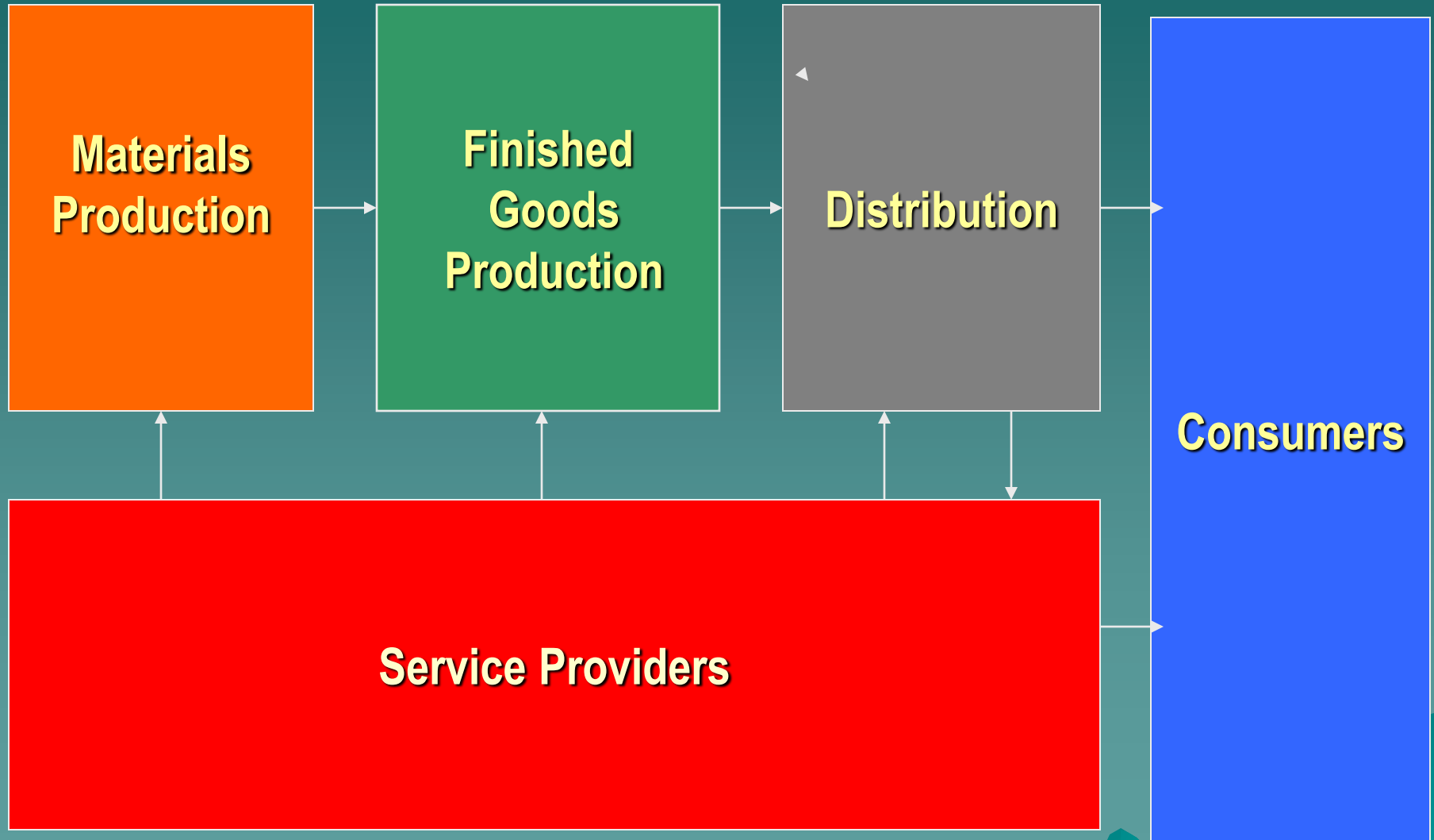
- ◆ A Manufacturer is a company that is all about adding value to raw materials to produce products.
- ◆ How Important is Manufacturing?
 - *Manufacturing is the largest payroll of all 20 sectors.*
 - *Mfg. wages are 20 % to 30% above average.*
 - *Each Mfg. job creates 3 more secondary jobs.*
 - *Mfg. accounts for 85% of all exports.*
 - *98% of all manufacturers are small business, ~30 employees.*
 - *84% of all patents are for manufactured goods.*

“Innovations aren't worth anything until they are worth something to the consumer.” In other words, Smart Grid innovations aren't worth anything until they are worth something to the consumer. Only then is there an opportunity for positive economic impact!

1 - How do New Technologies and Innovations relate to Manufacturing?

- ◆ There are 20 Industry Sectors (NAICS Codes) in the economy, grouped into 5 major categories:
 - Material Production
 - Finished Goods Production
 - Distribution
 - Services
 - Consumers

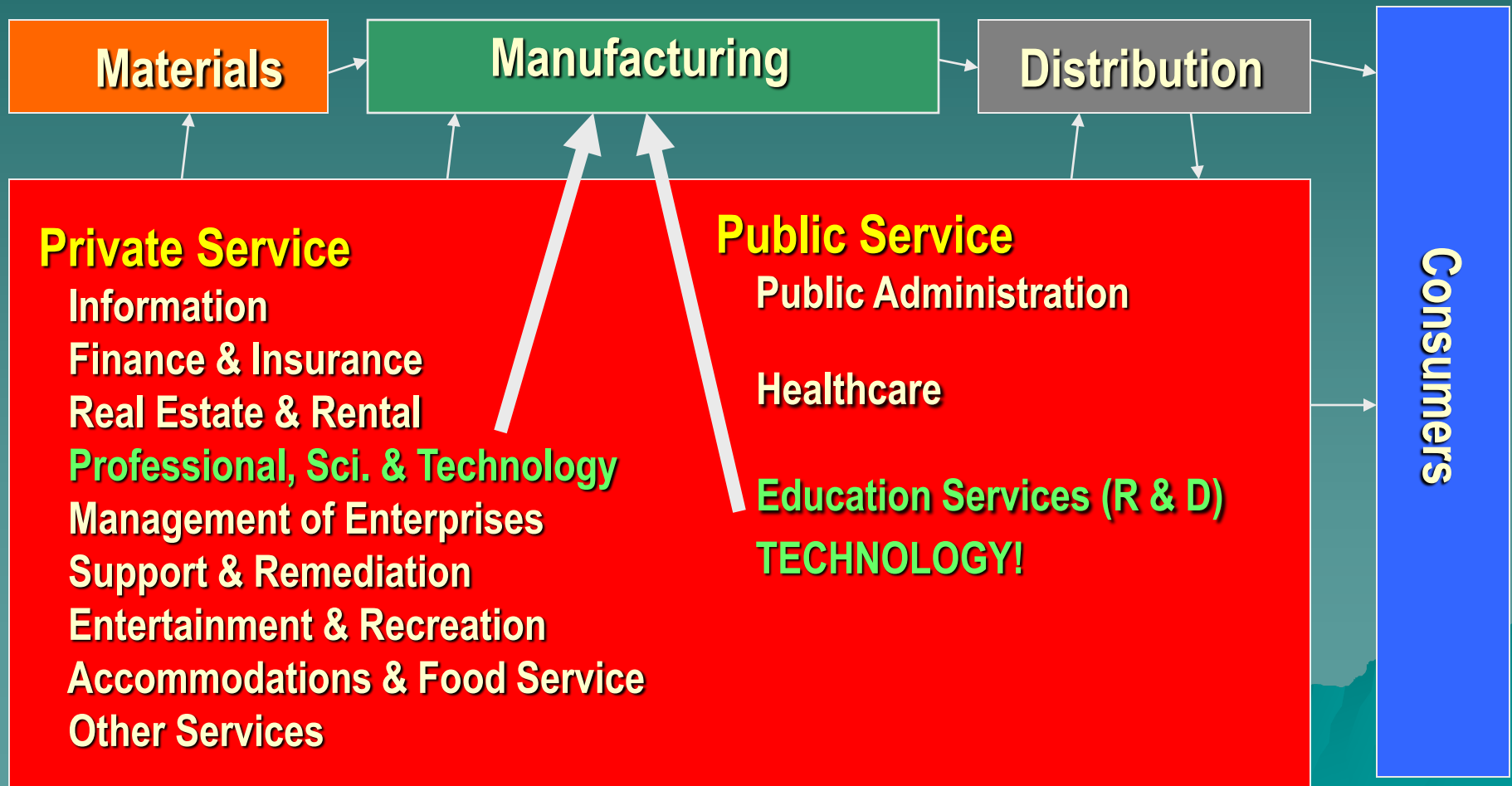
The 5 Major Components of the Economy



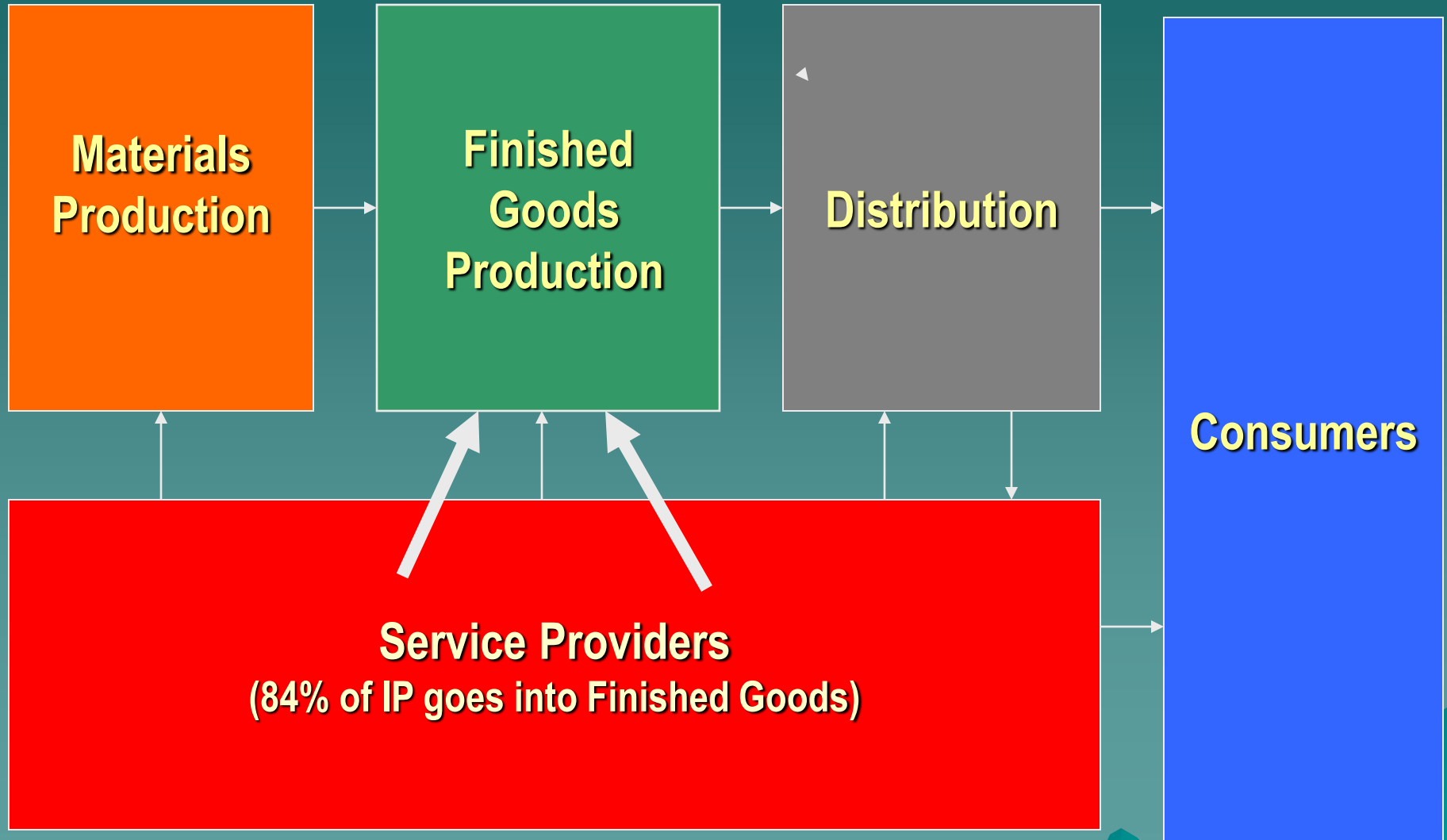
Manufacturing is key to economic viability!

Where does IP from Service Providers go?

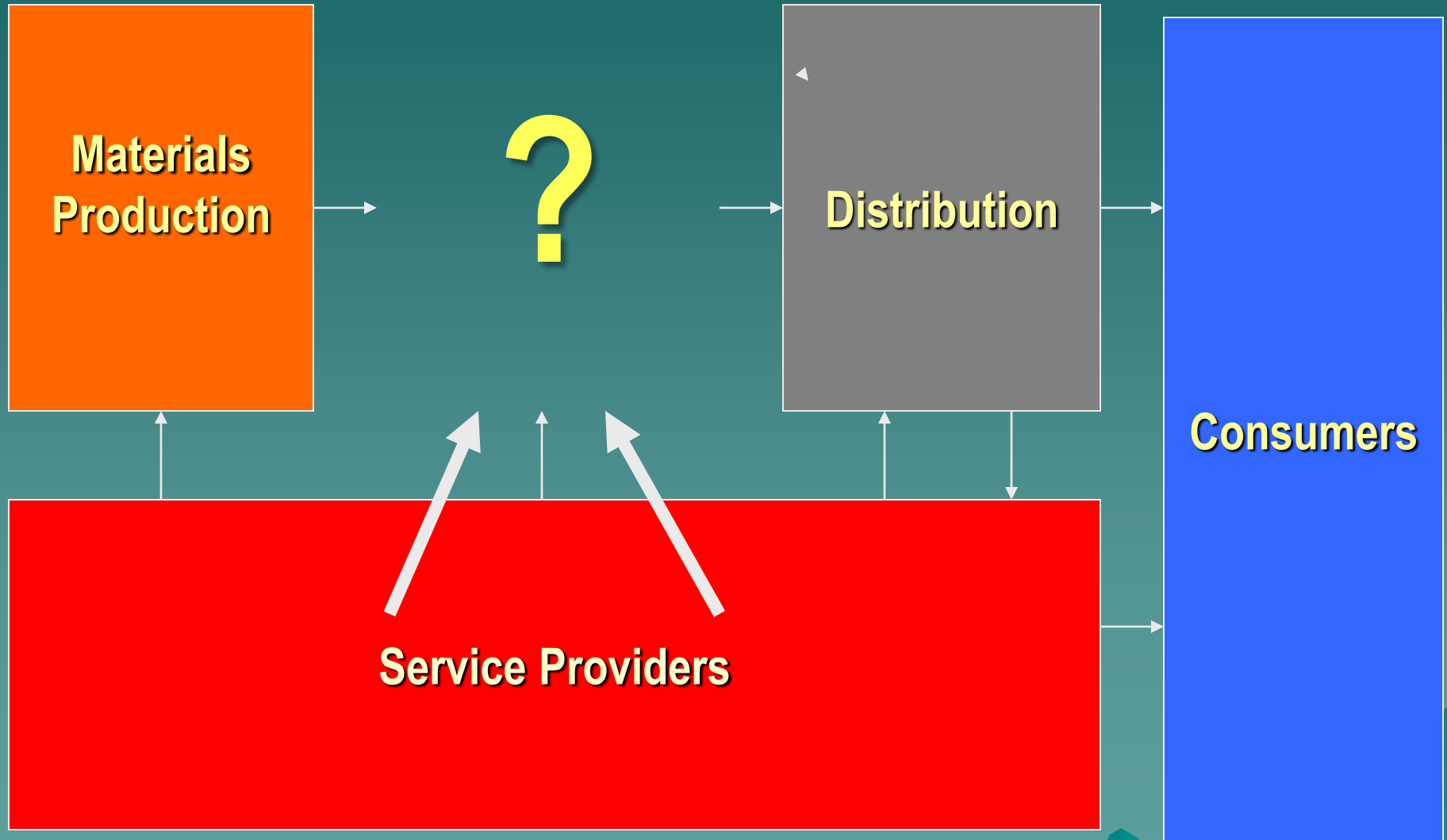
Manufacturing is the only major sector of all 20 sectors in the economy where value is added by incorporating new R&D technologies into products.



The 5 Major Components of the Economy



Manufacturing is key for economic viability!



What Must Manufacturer's Provide to Customers to Remain Competitive?

- ◆ A Product That Uniquely Meets Customer Needs
- ◆ A Product that can be Delivered Now
- ◆ A Product with Increased Value (More Functionality and/or Less Costs)

New Technology does not Automatically Result in Economic Development



How does this relate to Smart Grid Technology Deployment?

- ◆ The technology must help the product uniquely meet the clients need
- ◆ The technology must support timely delivery of the product
- ◆ The technology must add value and functionality or be more cost effective

2 – What Challenges do Manufacturers Encounter when Incorporating New Technologies and Innovations into Products?

New Processes, Facilities, Equipment & Staff

What type of companies can this project have most influence with ... large corporations, start ups or small companies?

How do they compare?

	Has Existing Clients	Uniquely Solves Needs	Responsive , Fast Delivery	Cost Effective (Lean)	Technical Staff & Resources
Large Corps					

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Large Corps					
New Start Up					
Small Co.					

*Small companies are our greatest opportunity

Manufacturing has Challenges

- ◆ Manufacturing Is capital intensive, supports above average wages and Is complex & highly technical and must be innovative to survive Must accommodate process changes.
- ◆ Small manufacturers have limited internal skills & resources.

Manufacturing has Challenges

What one manufacturer of Smart Grid products says...

- ◆ “#1 biggest challenge is finding and hiring qualified employees.”
- ◆ “#2 biggest challenge is keeping a consistent backlog.”
- ◆ “#3 US based customers moving their operations outside of the US, mostly because the US business environment seems to be deteriorating.”

3 – What can be done to help Manufacturers improve their likelihood for success?

Company viability, performance & qualified staff

Identify Manufacturers with High Potential Attributes (WBI Criteria)

◆ Business Viability

- New Combination
- Product Market Match
- Net Buyer-Benefit
- Margins
- Sales Volume⁵
- Purchase Frequency
- Product Longevity
- Resources for Growth

◆ Business Sustainability

- Competition¹
- Indirect Competition
- Inefficiency Factors
- Market Concentration
- Industry Experience
- Management Diversity
- Venturing Competence

Focus on Proven Productive Processes



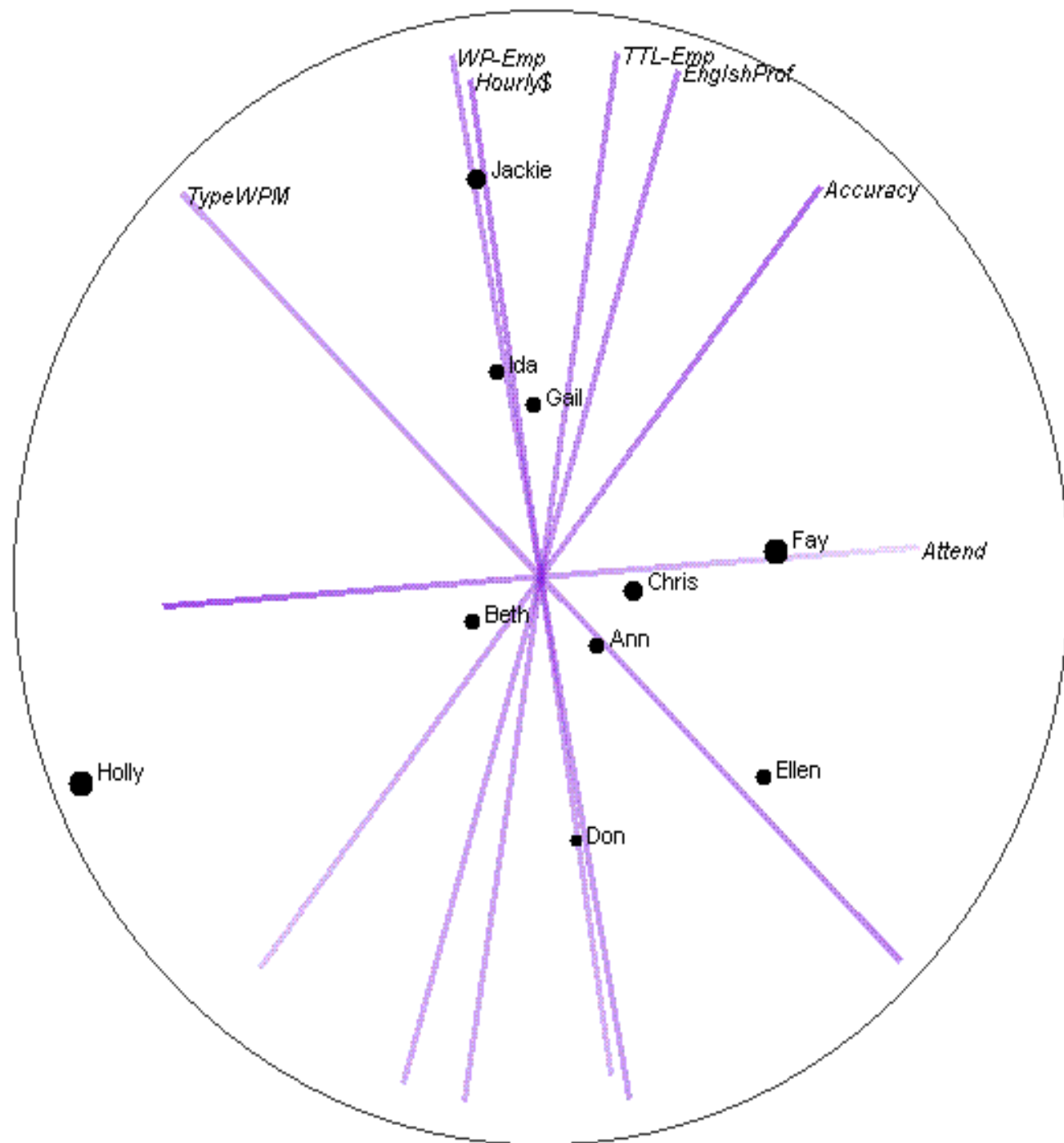
Help Develop a Well Qualified Staff

- ◆ Consider outside short term staffing resources.
- ◆ Develop qualified in-house staffing
 - *Develop a detailed matrix of job tasks.*
 - *Classify each worker relative to the task matrix.*
 - *Identify the gaps in knowledge and experience.*
 - *Perform a multivariate graphical analysis of all workers.*
 - *Provide specifically gap training for selected workers.*
 - *Provide class room and on the job field certifications.*

Multivariate Graphical Analysis

	Type Speed	Accuracy	Hourly \$	WP Emp	Tot Emp	Attend	Eng Prof
Ann	60	92	\$9.90	4	28	98	85
Beth	65	88	\$10.50	6	24	97	88
Chris	50	94	\$10.84	9	30	96	90
Don	45	85	\$7.90	2	14	99	78
Ellen	30	90	\$8.24	4	16	98	88
Fay	40	98	\$10.62	7	60	95	93
Gail	78	95	\$11.90	12	48	97	94
Holly	70	85	\$9.70	6	12	88	81
Ida	72	91	\$10.30	22	72	96	97
Jackie	80	97	\$13.44	30	84	95	98

Multivariate Graphical Analysis



1 - How do Smart Grid technologies relate to Manufacturing?

Manufacturing is where Smart Grid technologies become a reality ... when incorporated into innovative new products.

2 - – What challenges do Manufacturers encounter when incorporating new technologies & innovations into products?

Small manufacturers do not have adequate resources and qualified staff to produce the desired new innovative products.

3 - What can be done to help them improve their performance and their opportunity for success?

Identify high potential manufacturers focused on proven productive processes ... and help them develop or acquire a well qualified staff such as competent veterans.

The End

I mean...

The Beginning!