

LIVING with TECHNOLOGY

Topic Groupings

Click on any of the topics below to bring up the full Article for your review

General Topics – 01 to 13

01 Series Overview - Living with Technology - Advanced Technologies Think Tank - a never-ending learning experience to keep up with changing technology

02 **Economic Facts Everyone Should Know**, it might be called a guide for human's economic life. The ten rules show how simply the economic truth can be told.

03 **F1 Program for Schools**, aims to help change the perceptions of engineering, science and technology by creating a fun and exciting learning environment for young people to develop an informed view about careers in engineering, science and technology.

04 **Internet University**, offering free seminars on science, technology, and manufacturing technology online to anyone in the world.

05 **Measurement Through the Ages** – how humans have used different tools and instruments to arrive at a means of establishing standards to make parts identical and interchangeable.

06 **Society of Manufacturing Engineers** - a world-wide professional organization devoted to keeping its members up to date with technological changes that benefit manufacturing and society.

07 **Smart Machines**, developing machines that will allow manufacturing equipment to make decisions based on learned knowledge from previous experiences.

08 **Survival in Business/Manufacturing Today** – something must change in processes, people training, and equipment if we expect to get better results.

09 **Technology Phobia**, why people react to any changes that may affect the way things have always been done.

10 **The Law of Production**, everything contributing to Human's Material Welfare is the product of Natural Resources plus Human Energy multiplied by Tools.

11 **Diamonds, Natural and Manufactured** – Natural diamonds are used to symbolize eternity and love and used for engagement and wedding rings. Manufactured diamonds are mainly used for industrial purposes.

12 **Technology Careers** - New technologies have created many opportunities for careers in manufacturing.

13 **Skills USA** – An organization that prepares high school and college students with leadership training in the field of their chosen profession.

14 **Advanced Design and Manufacturing Institute (ADMI)** program - The program's goal is to provide practicing engineers with the enhanced skills and capabilities to become leaders in today's demanding, complex business world.

15 **Mondragon Cooperatives** - A cooperative is a voluntary contractual organization of persons having a mutual ownership interest in providing themselves a needed service(s) on a nonprofit basis

16 **Gods Own Children** - As a result of a 20 year civil war and a natural disaster, the Gods Own Children Foundation was formed to provide free education to mentally and physically disabled children

17. **Ultracapacitor Power Cells** - Are an electrical energy storage unit that could have ten times the energy punch of a lead-acid battery of similar weight and may cost half as much and should be available sometime in 2008

Technology Discoveries – 20 to 40

- 20 **Ball Bearings** – the world revolves or slides on ball bearings.
- 21 **Bar Codes** – helps retail chains and supermarkets keep a record of sales and inventory at the same time.
- 22 **How Batteries Work** – How they generate electrical power.
- 23 **Bicycle** – the vehicle of choice before the coming of the automobile.
- 24 **Computers** – the invention that affected the way we live, work, and play.
- 25 **How Computers Work** - The Most Important Discovery made by Humans.
- 26 **Deep Sea Technology** – How we got to explore the riches beneath theseas.
- 27 **How Electricity is Produced** – How it gets to your home
- 28 **First Air Mail** – The early air mail and transcontinental flight.
- 29 **Helicopter Development** – Sikorsky’s role in its development.
- 30 **Laser** – the controlled light that can be used for many uses from manufacturing, measuring, bar coding, and medical uses.
- 30B **Fuel Cells** - A fuel cell is an electrochemical device that uses a combination of hydrogen and oxygen to produce electricity, with water and heat as its by-product
- 31A **Modern Bridges** – Othmar Ammann left his mark on New York City and world bridges.
- 31B **Millau Bridge**, France - The world’s tallest bridge that takes motorists on a drive 270 meters (885.8 feet) above the Tarn River Valley in France.
- 32 **Microprocessors** - the heart of the computer and the role they pay in how we live, work and play.
- 33 **Numerical Control** – the revolution of using numbers to control machines improved the efficiency of any machine and increased productivity.
- 34 **Radar** – its importance in weather forecasting, air traffic control, ground traffic control and detection systems.
- 35 **Samuel Morse** – the start of the communications revolution.
- 36 **Windmills in America** – the role they played in America’s expansion across the continent.
- 37 **Global Positioning System** - The Global Positioning System consists of 24 orbiting satellites and their ground stations.
- 38 **OnStar** - Provides subscribers with directions, medical emergencies, tracking stolen cars, etc.
- 39 **The Amazing BlackBerry** - is a wireless handheld instrument that supports push e-mail, mobile telephone, text messaging, internet faxing. Research In Motion Technology
- 40A **20th Century Technical Discoveries** – the first 50 years of building global productivity.
- 40B **20th Century Technical Discoveries** Cont’d – the second 50 years of building global productivity.

Manufacturing Leaders - 41 to 50

- 41 **Dr. Deming** - the person who, in the 1950s and 1960s, changed Japan from a junk toy manufacturer to a leading manufacturer of high-quality goods in about 10 years.
- 42 **Dr. Deming’s 14 Points** – these principles were designed for management and organizations to increase the quality of manufactured goods and lower costs.

- 43 **Dr. Merchant** - often regarded as the father of modern-day manufacturing and the Philosopher of manufacturing.
- 44 **Iaccoca, Lee** - often referred to as the person who saved the Chrysler Company from bankruptcy in the late 1970s and early 1980s.
- 45 **Mazak Corp.** – the number one Machine Tool Manufacturer in the world.

Lean Tools and Principles – 51 to 70

- 51 **Company Heading for Trouble** – warning signs a company will soon be facing problems serious problems unless corrective action is taken.
- 52 **Coping with Resistance** – a guide to assist management in getting the workers to overcome their resistance to change.
- 53 **Creation of Ideas** – rekindling the spirit of learning so workers become aware of the need for change and work with you and not for you.
- 54 **Leadership** – the art and science of influencing the actions of others toward the achievement of goals.
- 55 **Lean – Change or Perish** – recognizing the need for change to keep up with the rest of the world or going out of business.
- 56 **Lean Initiative** - a speech by Toyota’s Chairman where he asked everyone in the company to change by improving their skills and processes.
- 57 **Lean Inventory Control** – a large inventory, more than there are orders for, is the biggest waste for a company because it takes up valuable space and money tied is up.
- 58 **Lean – Its Amazing Benefits** – the benefits of Lean have been proven by many companies throughout the world who have recorded their successes.
- 59 **Lean Overview** – the tools available to the world for making companies and businesses competitive in the world markets.
- 60 **Lean, The Ultimate Survival Tool** - without becoming more efficient by reducing waste and increasing efficiency, many companies may not survive.
- 61 **Lean Timeline** – a history of Lean from its use by Eli Whitney until its refinement into the Toyota Production System.
- 62 **Managing Human Resources** – the ability to work well with workers is the prime quality an executive must achieve so they work with you and not for you.
- 63 **Teamwork** - the need for everyone in a company to work together to make a successful company and save jobs.
- 64 **The Magic Bullet** - about making changes requires everyone to do their part for the good of all.
- 65 **The Seven Typical Wastes** - found in most businesses, industries, and organizations.
- 66 **Where Does Change Start** - Change must start with management who must lead workers.

Lean Manufacturing – 71 to 79

- 71 **Cellular Manufacturing** – a main Lean tool where workers and machine are arranged for the most efficient and productive work flow.
- 72 **Continuous Improvement** – an improvement process that is gradual and never ending. It can be described as a journey and not a destination.

- 73 **Pull (Kanban) Systems** – this system responds to the needs of the customer and no work is started until an order has been received from the customer.
- 74 **Total Productive Maintenance** – can be described as the health care of tools and equipment so no unexpected problems that may cause a stop in production occur.
- 75 **Value Stream Mapping** – following a production path from beginning to the end to identify and remove as many wastes as possible.
- 76 **Workplace Organization** – Lean succeeds in a clean, organized workplace. An untidy or disorganized workplace leads to wasted time and energy.

Manufacturing 80 to 90

- 80 **How to Stop the Erosion of our Manufacturing Base** - covers the tools available today to save our manufacturing industries.
- 81 **Justifying Advanced Technologies** - how these quickly repay the investment by increasing productivity while producing quality consumer goods.
- 82 **Technology Resources** – things we need to get the job done.
- 83 **The Evolution of Manufacturing** - how it has benefited humans over the ages.
- 84 **Tools and Profit** - the need for both in a successful company or business.
- 85 **Why Manufacturing is Important** - to the economy of a country and the standard of living its people enjoy.
- 86 Zero-Defect Manufacturing – Zero-defect manufacturing is possible with today's machines and technology.
- 87 **Offshore Competition** – Labour costs are not the biggest factor to consider.
- 88 **A Technological Plan for Manufacturers** - Supply workers with the best tools possible, and provide a training program so they can get 100% of the benefits of the technology.

Manufacturing Processes 91 to 105

- 91 **Diamond Coating QQC** - coating applied to a wide variety of material to preserve their cutting edge and improve their wear resistance.
- 92 **Direct Metal Deposition** - the blending of five common technologies to create parts by laser-focused beam.
- 93 **Electrical Discharge Machining** - the cutting of ferrous material using electric spark erosion as the cutting tool.
- 94 **E-Manufacturing** - Making machines into smart partners to be networked into an enterprise-wide information system
- 95 **Error-Proofing** - devices that can be used to warn about a potential problem and may soon cause a breakdown resulting in production stoppage.
- 96 **Intelligent Maintenance Systems** - changing from a Fail and Fix approach to a Predict and Prevent approach.

97 **MultiTasking Machines** – the Lean machine of the future is here today. It can perform the operations, in one setup, that normally required 6 or more machines previously.

98 **Manufacturing Intelligence** - Real-time refers to having access to production events, the moment they occur.

99 **Yesterday, Today, Tomorrow** - Yesterday is History, Today is the Present, and Tomorrow is a Mystery.

Manufacturing in the Future - 110 to119

110 **Manufacturing in the Future** - the effects of nanotechnology and how it will change the way products are manufactured using atoms and molecules with no depletions of natural resources and no pollution.

111 **Touch the Future** – a projection to the year 2019 by the Mazak Company on how our lives will change in regards to travel, power generation, shopping, health care, environment, and information technology.

112 **Metal Rubber** - Twist it, stretch it double, fry it to 200°C, douse it with jet fuel—the stuff still survives.

113 (1) **Nanotechnology** – the world is on a brink of a technological revolution capable of bringing wealth, health, and education to all.

113 (2) **Nanotechnology** (cont'd)

114 **Autonomous Navigational Technologies**