

SPC

LESSON: Quality Management; Practices, Standards, and Tools



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Measuring Quality Performance

- **Benchmarking** – comparing your company's practices with best practices in the business
- **ACSI** – American Customer Satisfaction Index (e.g., Papa John's pizza box)
- **Baldrige Award**
- **Poka-yoke**
- **International Standards Organization**
- **Capability Analysis: Cp, Cpk** (control charts)

Evolution of Benchmarking: Xerox

Xerox invented the photocopier in **1959** and maintained a virtual **monopoly** for many years; "Xerox" WAS the **generic name for all photocopiers**.

By **1981**, the company's market shrank to **35%** as IBM & Kodak developed high-end machines and Canon, Ricoh, and Savin dominated the low-end segment of the market.

The Xerox vice president of copier manufacturing: “we were horrified to find that **Japanese were selling their machines at what it cost us to make ours...**we were benchmarking against ourselves. We weren’t looking outside.”

Xerox suffered from the “**not invented here**” **syndrome**, they did not want to admit that **they were not the best**.

The company instituted the **benchmarking** process with resistance. People did not believe it could be done better.

Reaction: denial > dismay > frustration > action. Eventually, the company **benchmarked virtually every function** and task for productivity, cost, and quality.

Comparisons were made for companies **both in and outside the industry**. For example, the distribution function was compared to L.L. Bean.

Xerox **would not be in the copier business** today if it were not for **benchmarking**. Results were dramatic:

- **Suppliers** were **reduced** from **5000 to 300**.
- “**Concurrent engineering**”: Each product development group has input from design, manufacturing, and services from the initial stages of the project.
- **Commonality of parts increased: 20% to 60%+**

Hierarchical organization structure was reduced, and use of cross-functional “Teams Xerox” was established.

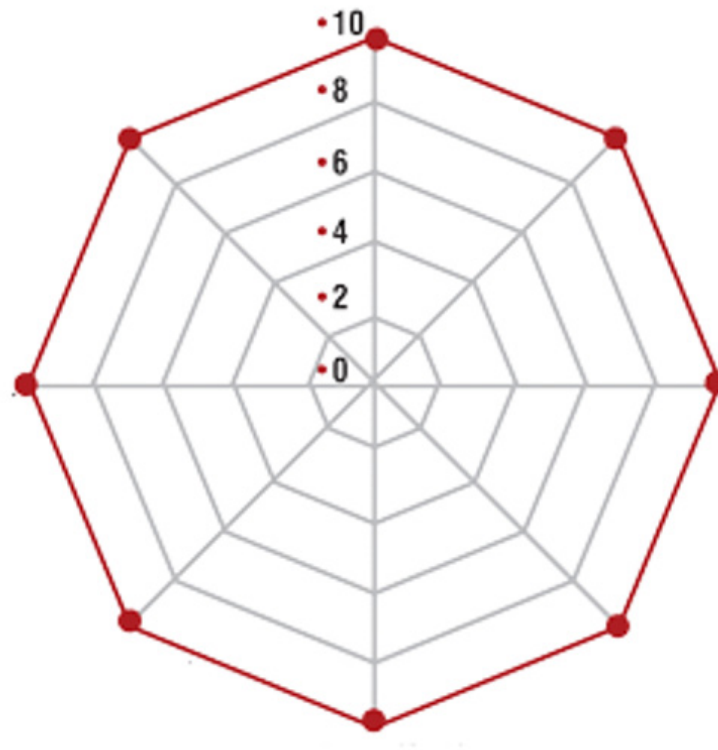
All of these improvements were not the direct result of benchmarking. Benchmarking can be a good intervention.

Benchmarking

1. Decide **what to benchmark**
2. Develop a **benchmarking plan**
3. Select a **method to collect data**
4. **Collect data**
5. **Select companies** to benchmark
6. Collect data during **site visits**
7. **Compare processes**, identify gaps, make recommendations
8. **Implement recommendations**
9. **Recalibrate** benchmarks

Best Fitness Benchmarking Example

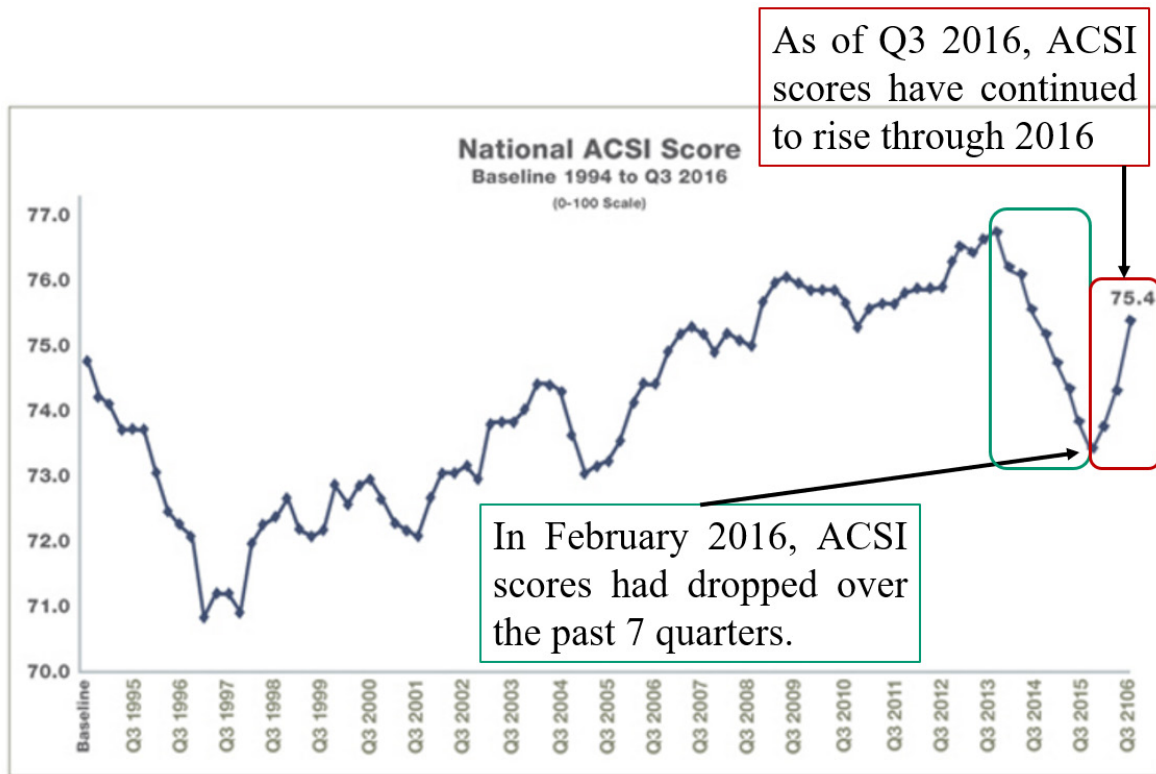
Heart rate, gym time, BMI, running time, flexibility, weight training, aerobic fitness, strength, balance.



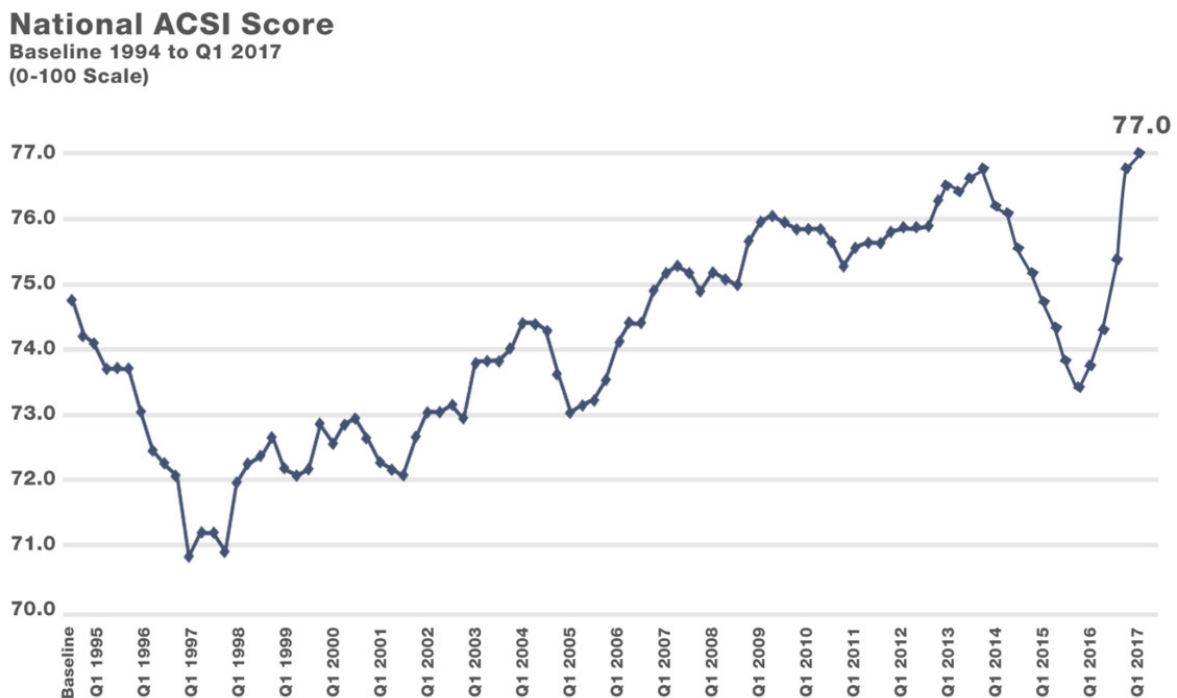
Football fans: NFL players [benchmarking](#) site

American Customer Satisfaction Index

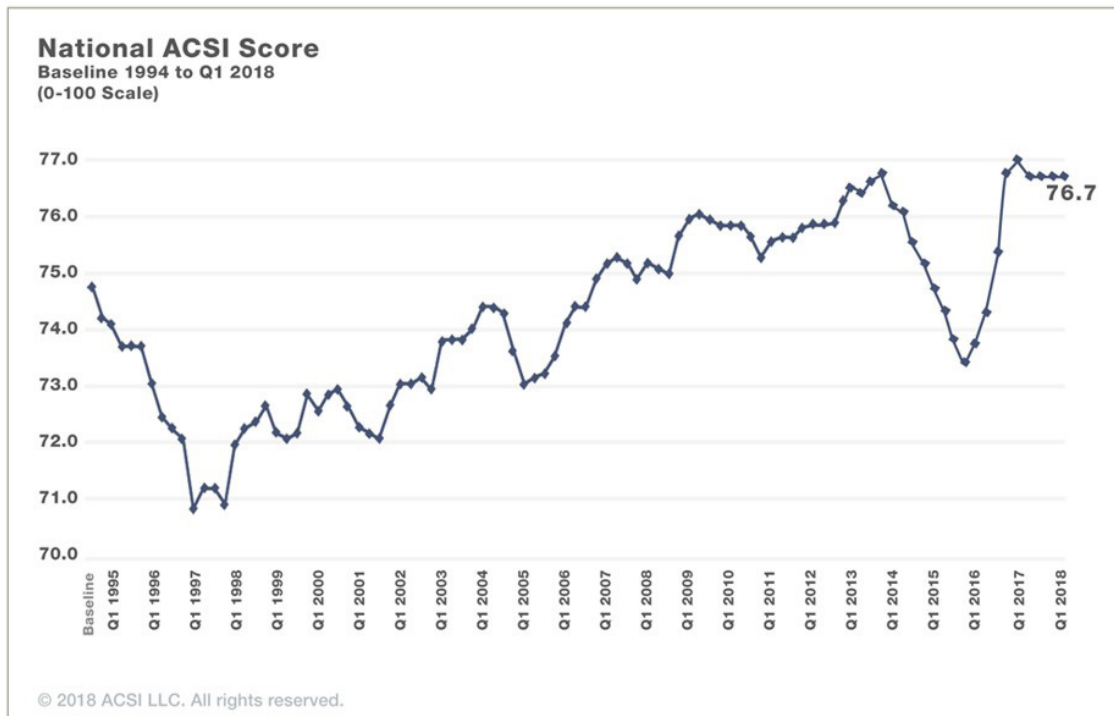
- **American Customer Satisfaction Index (ACSI)** is a uniform and independent measure of household consumption
- **Powerful economic indicator**
- The ACSI tracks **trends in customer satisfaction** and provides valuable benchmarks of the consumer economy for companies
- Provides **useful information on quality** to complement present measures of the U.S. economy
- **Measures customer satisfaction at national level** (43 industries, 225+ companies); **Scale 0-100**; ACSI has consistently **predicted future consumer spending** and is an indicator of financial performance at both the company and industry level
- Introduced in **1994** by **University of Michigan**, American Society for Quality, and the international consulting firm, CFI Group
- Website: <http://www.theacsi.org/>



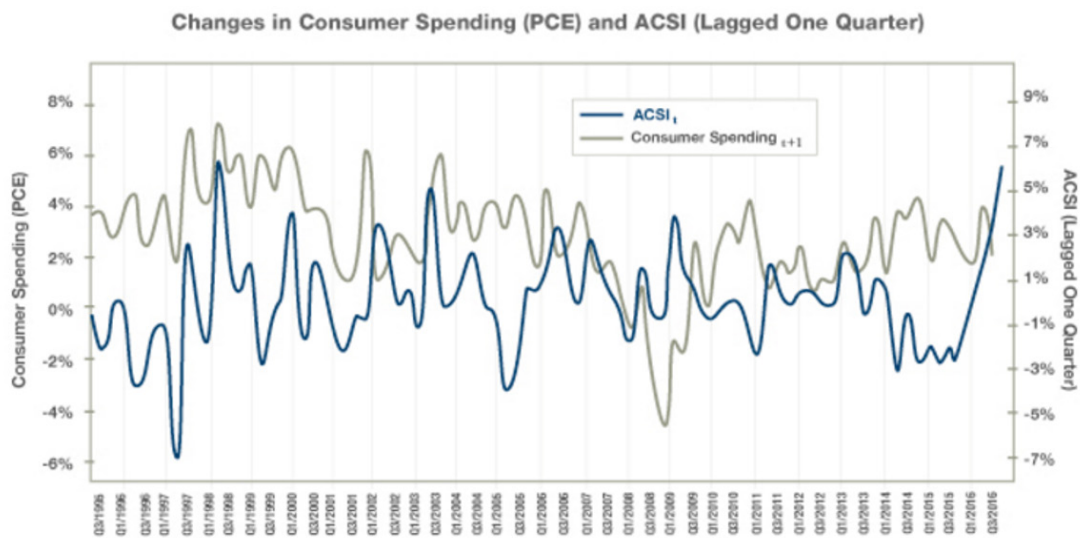
As of Q1 2017, ACSI scores were continuing to rise, but more slowly than the past year.



As of Q1 2018, ACSI scores have dropped from Q1 2017 and been flat since.



ACSI scores are good predictors of future consumer spending



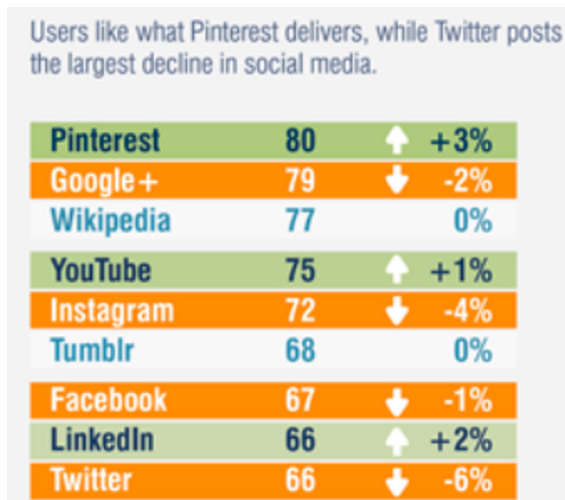
“Stagnation in the national ACSI score points to average future spending growth at best, making the prospect of economic growth more difficult.”

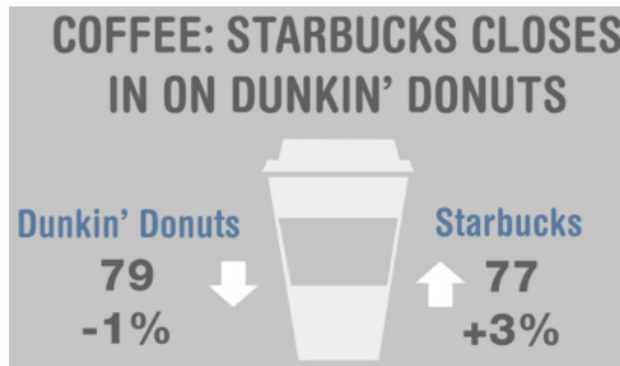
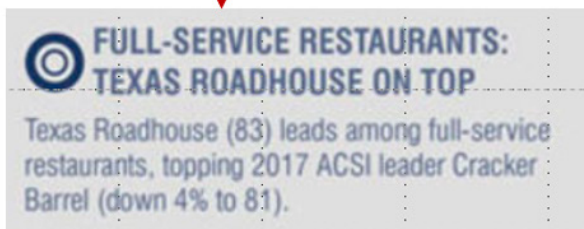
Q1 2018 Report: ANN ARBOR, Mich., (7/12/18)

- Customer satisfaction remains unchanged for the fourth consecutive quarter in a less-than-encouraging sign for the economy.
- The ACSI® national aggregate score of customer satisfaction stood still @ 76.7, marking the longest stretch of stagnation since inception in 1994.
- The score is more than 2 points above the long-term historical average, and no change is better than a decline, but the **lack of improvement has troubling implications for the economy.**

2018 ACSI News:

- (8/28) Customer Satisfaction With Cars Is Up, But Tariff Threats Cloud the Horizon
- Subaru takes the crown among mass-market vehicles
- Luxury vehicles have a new contender: Volvo
- (7/24) Data Privacy, Ads Drive Customer Dissatisfaction in Social Media
- Pinterest takes top marks in customer satisfaction among social media
- Google (82) dominates search (as usual), but MSN leaps up the rankings (up 6% to 76)



2017**2017****2017****2017****2018**

Limited-Service Restaurants

	Base-line	95	96	97	13	14	15	16	17	18	Previous Year % Change
Chick-fil-A	NM	NM	NM	NM	NM	NM	86	87	87	87	0.0
All Others	73	74	75	73	82	84	81	81	82	82	0.0
Panera Bread	NM	NM	NM	NM	NM	NM	80	81	82	81	-1.2
Limited-Service Restaurants	69	70	66	68	80	80	77	79	79	80	1.3
Subway	NM	NM	NM	NM	83	78	77	80	81	80	-1.2
Papa John's	NM	NM	NM	NM	82	82	78	82	82	80	-2.4
Pizza Hut (Yum! Brands)	69	66	63	71	80	82	78	77	76	80	5.3
Domino's	67	70	68	68	81	80	75	78	78	79	1.3
Chipotle Mexican Grill	NM	NM	NM	NM	NM	NM	83	78	79	79	0.0
Arby's	NM	NM	NM	NM	NM	NM	74	80	80	79	-1.3
Dunkin' Donuts	NM	NM	NM	NM	80	75	78	80	79	78	-1.3
Starbucks	NM	NM	NM	NM	80	76	74	75	77	78	1.3
Wendy's	72	73	71	69	79	78	73	76	76	77	1.3
Little Caesars	72	69	69	73	82	80	74	81	78	77	-1.3
KFC (Yum! Brands)	67	68	69	67	81	74	73	78	78	77	-1.3
Burger King	66	65	67	68	76	76	72	76	77	76	-1.3
Taco Bell (Yum! Brands)	66	66	66	67	74	72	72	75	76	74	-2.6

Pizza Hut is now the official pizza of the NFL.

2011 Headline:

- Customer satisfaction with **Netflix** does a predictable **nosedive for 2011**, crashing down **14% to 74**, one of the biggest year-on-year losses in ACSI history.
- Netflix shed scores of customers in the fall of 2011, following price hikes and a **controversial plan to move DVD-by-mail customers to a separate service**.
- While the plan was abandoned and the company has since started adding subscribers, the **toll on customer satisfaction is heavy and Netflix remains in a precarious position** relative to the rest of the industry.

Malcolm Baldrige Quality Award

In the **1980's** the **U.S.** recognized that in order to compete in a global economy, they needed to **focus on quality**. Established in **1987**. Baldrige was Secretary of Commerce. Similar to the **Deming Prize** in Japan.

Goals:

- Help **improve quality in U.S.** companies.
- Recognize achievements of excellent firms** and provide examples to others.
- Establish criteria for **evaluating quality efforts**.
- Provide **guidance and motivation** for other U.S. companies.

February 2011: Quality Digest Daily recently reported that the National Commission on Fiscal Responsibility and Reform (NCFRR) suggested, as a means to reduce the nation's debt, the elimination of the Baldrige Performance Excellence Program. As of 2012, there is no longer Federal support for the program.

Criteria for Performance Excellence

1. Leadership
2. Strategic Planning
3. Customer and Market Focus
4. Information and Analysis
5. Human Resource Focus
6. Process Management
7. Business Results



Baldrige Award trophy

Poka-Yoke: Quality in Development/Design

Most Quizno's restaurants admonish its customers with signs saying, "Please Do Not Throw Away Baskets."

The Quizno's trays fit into the trash hole. I wonder how many trays they lose a day?

Quizno's is just shifting the mistake proofing onto the customer rather than dealing with it themselves.



Poka-Yoke Example (aka dummy-proofing)

Other "Error Proofing" Examples?

From my office: File cabinets can fall over if too many drawers are pulled out. For some file cabinets, opening one drawer locks all the rest, reducing the chance of the file cabinet tipping.

Even bathroom sinks have a mistake-proofing device: the little hole near the top of the sink prevents overflows.

OTHERS?

ISO 9000 Standards (recent update in 2015*)

[International Organization for Standardization \(ISO\)](http://www.iso.org) is the world's **largest developer** and publisher of **International Standards**.

ISO International Standards ensure that **products and services are safe, reliable and of good quality**. A **standard** is a **document** that provides **requirements, specifications**, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are **fit for their purpose**.

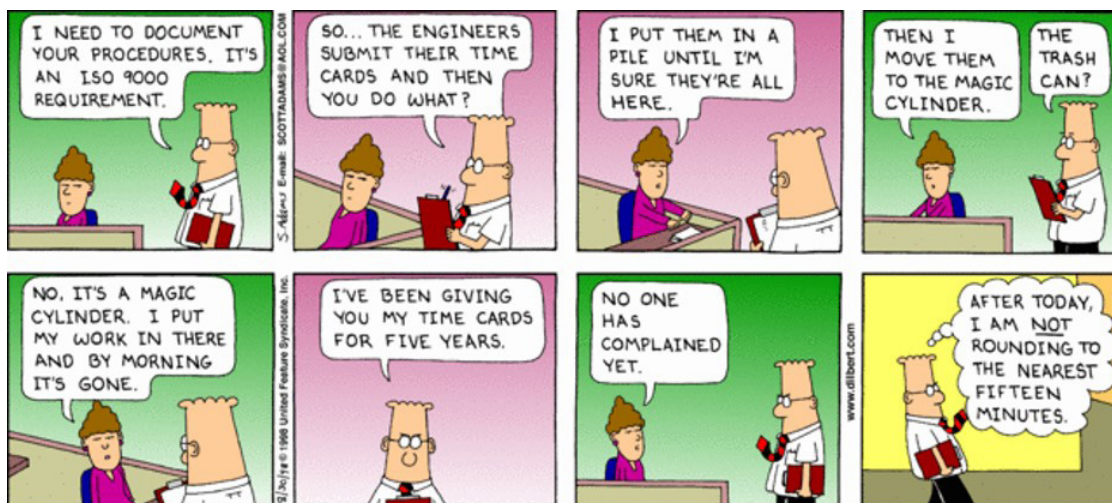
Conformity to International Standards helps reassure consumers that products are **safe, efficient and good for the environment**.

ISO is a **network** of the national standards institutes of **163 countries**, one member per country, with a Central Secretariat in Geneva, Switzerland.

Originally published in 1987; revised in 1994 and 2000, 2008, and just recently in 2015. It's possible to meet ISO Standards, but still have bad quality....



ISO Certification is used to certify that companies do what they say they are doing.



There must be Standard Operating Procedures (SOP) for every process to pass an ISO audit. Employees must be following these SOPs.

Example 1. ISO/IEC 7810: Identification/Credit Cards: **Physical characteristics** is an international standard that defines the physical characteristics for ID cards. The characteristics specified include:

- Physical dimensions
- Resistance to bending, flame, chemicals, temperature and humidity
- Toxicity

The standard includes test methods for resistance to heat.

Note: IEC: International
Electrotechnical Commission



Example 2. The requirements in ISO 8124-1:2012 apply to all toys, i.e., any product or material designed or clearly intended for use in play by children under 14 years of age.

- Specify acceptable criteria for structural characteristics of toys, such as shape, size, contour and spacing
- When manufacturers comply with the provisions of ISO 8124, the number of accidents is expected to drop considerably.



The Certification Process

How to become ISO compliant.

1. Prepare **required documentation** and systems.
2. Often **hire a consultant** to assist.
3. Hire **third party auditor** to review your system.
4. If **Pass** – become **ISO ‘registered’**.
 - ◇ Certified to a particular year standard– 1994, 2000.
 - ◇ Must follow and use the system.
 - ◇ Have regular audits by third party inspector.
 - ◇ If fail the audit, can loose certification.
5. If **No** – revise and retest.



ISO sightings: