Central Connecticut State University
Department of Geography
Introduction to Planning

Lecture 10. Planning, Management, and Data Analysis

Adjunct Lecturer:
Donald J. Poland, MS, AICP
E-mail: Polandd@ccsu.edu
Web: www.donaldpoland.com

Planning and Management

Planning and The Deming Management Method

Managing – Planning and the Land Use System

- A significant part of being a planner, is management.
- Poland's Four P's of Management:
  - **People:** The management of people, planning and land use department staff, consultants, and others
  - **Policies:** The management (administering and implementing) of departmental, town, and land use policy
  - **Processes:** The management (administering and implementing) the process of commission and department applications and permits
  - **Procedures:** The development and implementation of departmental and other procedures to manage the three P's above
- Management in planning is about understanding people and the system of land use that we work within.
- While there are many theories of management, The Deming Management Method is very well suited for planning, land use, and public administration.

The Deming Management Method

Planning and The Deming Management Method

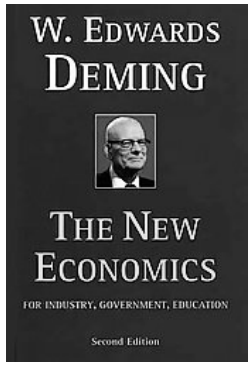
Managing – Planning and the Land Use System

- The Deming Management Method is well suited for planning, land use, and public administration because it combines management principles with system theory, data analysis (variation), problem solving (PDSA Cycle of Learning), and psychology:
- The Intent of this lecture is to provide a general overview of The Deming Management Method:
  - The Fourteen Points of Management
  - The Seven Deadly Diseases
  - The Obstacles that Thwart Productivity
  - The System of Profound Knowledge
  - The PDSA Cycle of Learning
- The application of The Deming Management Method to planning, land use, and public administration
  - Understanding Planning and Land Use as a System (The Land Use System)
  - Understanding Data and the application of Common Cause and Special Cause Variation in planning and land use analysis

Planning and The Deming Management Method

Dr. W. Edwards Deming – Biography (1900 to 1993)

- Earned a BS in electrical engineering, University of Wyoming (1921). An MS, University of Colorado (1925). A doctorate in mathematical physics, Yale University (1928).
- Studied statistical theory under Walter A. Shewhart, world renowned expert in variation and control charts.
- 1927, took a job with the U.S. Dept. of Agriculture Fixed Nitrogen Research Laboratory.
- 1939, joined the U.S. Census Bureau as a statistical advisor—played a key role in the sampling technique first used in the 1940 census.
- 1946, left the Census for a private consulting practice and to be a professor of statistics at the Graduate School of Business, New York University where he taught till death in 1993.



Planning and The Deming Management Method

Deming and Quality Control – The Transformation of Japan

- 1947, hired by the Supreme Command of Allied Powers as an advisor on Japan's 1951 census.
- 1950, invited by The Union of Japanese Scientists and Engineers (JUSE) to teach the application of statistics for quality improvement.
- Developed a lecture course that began June 16, 1950 to a standing room only crowd at Tokyo University. Told Japanese managers that if they followed his methods "they would capture markets the world over within five years." It happened in four years.
- Returned to Japan in 1951, 1952, 1955, and 1956 to continue his teachings.
- 1950 JUSE established the Deming Prize—awarded to persons and companies for excellence in the research, dissemination, and application of statistical quality control methods.
- May 1960 awarded the Second Order Medal of the Sacred Treasure by the Emperor of Japan—highest award Japan can bestow on a foreigner.

Planning and The Deming Management Method

Deming in America – "If Japan Can Do It, Why Can't We?

- June 1980, NBC aired a documentary "If Japan Can, Why Can't We?" This introduced Deming and his teachings to America. American industry listened for the first time and he began teaching some of America's largest companies his management and statistical control methods.
- Ford (the Taurus) was the first time an American car company used market research before product development began. Ford found out what the customer wanted (1,401 "wants") for the Taurus of which more than 700 were incorporated. 1992 the Taurus was the best selling car in America (outselling the Honda Accord).
- 1987, awarded the National Medal of Technology by President Reagan.
- 1982, published *Out of the Crisis*.
- 1988, published *The New Economics*

Planning and The Deming Management Method

The Deming Method – The Fourteen Points of Management

1. **Create "constancy of purpose"** toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs. (***Applied to Planning:*** *A "Consistency" of Purpose are the vision, goals, outcomes, and policies developed in the Plan of Conservation and Development. Also, the processes and procedures (regulations, applications, permits, enforcement, and implementation) put in place to administer and implement the Plan of C & D.)*
2. **Adopt the new philosophy.** We are in a new economic age. Western Management must awaken to the challenge, must learn their responsibilities, and take on leadership for change. ***(Applied to Planning:*** *Planning and the system of land use have become more complex and challenging as our urban form and the issues that face communities have become more complex. The "status quo" and conventional approaches are no long sufficient. The new philosophy must recognizes land use as system, "a network of independent components that work together to try to accomplish the aim of the system.")*

Planning and The Deming Management Method

The Deming Method – The Fourteen Points of Management

3. **Cease dependence on mass inspection to achieve quality.** Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. **End the practice of awarding business on the basis of price tag.** Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.
5. **Improve constantly and forever the system of production and service,** to improve quality and productivity, and thus constantly decrease costs. (*A continual commitment to and process of improvement of the land use system.)*
6. **Institute training on the job.** *(The need to for ongoing for all land use staff including administrative support positions.)*
7. **Institute leadership.** The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.

Planning and The Deming Management Method

The Deming Method – The Fourteen Points of Management

8. **Drive out fear,** so that everyone may work effectively for the company. *(The adversarial nature relates to fear. "Where there is fear, there are wrong numbers." The land use system must be transparent, consistent, and predictable.)*
9. **Break down barriers between departments.** People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product of service. *(Planning, zoning, economic development, building, engineering, public works, health, and all other departments involved in the land use system must work together on the common aim and to continually improve the system.)*
10. **Eliminate slogans, exhortations, and targets for the workforce asking for zero defects and new levels of productivity.** Such exhortations only create adversarial relationships, as the bulk of the cause of low quality and low productivity belong to the system and thus lie beyond the power of the work force. *(Move away from the latest planning fads and terminology.)*

Planning and The Deming Management Method

The Deming Method – The Fourteen Points of Management

12. **Remove barriers that rob the hourly worker of his right to pride of workmanship.** The responsibility of supervisors must be changed from sheer numbers to quality. Remover barriers that rob people in management of their right to pride of workmanship. This means abolishment of the annual or merit rating and management by objective.
13. **Institute a vigorous program of education and self-improvement.**
14. **Take action to accomplish the transformation.** Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

Planning and The Deming Management Method

The Deming Method – The Seven Deadly Diseases

1. **Lack of constancy of purpose** to plan product and service that will have a market and keep the company in business, and provide jobs. *(Implement planning, long term planning, the Plan of Conservation and Development)*
2. **Emphasis on short-term profits:** short-term thinking, fed by fear of unfriendly takeover, and by push from bankers and owners for dividends.
3. **Evaluation by performance, merit rating, or annual review of performance.**
4. **Mobility of management; job hopping.**
5. **Management by use only of visible figures,** with little or no consideration of figures that are unknown or unknowable.
6. **Excessive medical costs.**
7. **Excessive costs of liability,** swelled by lawyers that work on contingency fee.

Planning and The Deming Management Method

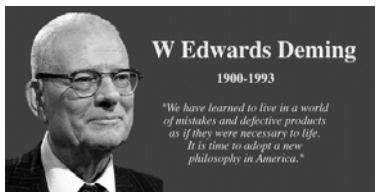
The Deming Method – The Obstacles That Thwart Productivity

- Hope for instant pudding. Neglect of long-range planning and transformation. *(There are no simple solutions to complex problems. Design and form alone will not overcome a weak market.)*
- The supposition that solving problems, automation, gadgets, and new machinery will transform industry. *(Smart growth, new urbanism, GIS, and 3D visualization are planning, but not the ultimate solutions)*
- Search for examples. *(One size does not fix all. There are no out-of-the-box solutions.)*
- Our problems are different. *(While each community is unique, they are not so unique that their problems are different.)*
- Obsolescence in schools.
- Poor teaching of statistical methods in industry. Reliance on quality control departments.
- "Our troubles lie entirely in the work force." Blaming the workforce for problems.

Planning and The Deming Management Method

The Deming Method – The Obstacles That Thwart Productivity

- False Starts. *(The development of plans with no implementation.)*
- "We installed quality control." Quality by inspection.
- The unmanned computer. *(Technology is not the solution.)*
- The supposition that it is only necessary to meet specifications.
- The fallacy of zero defects.
- Inadequate testing of prototypes.
- "Anyone that comes to try to help us must understand all about our business."



Planning and The Deming Management Method

The Deming Method - System of Profound Knowledge

- Deming states, a system cannot understand itself. If people do not see the process, they can not improve it. Transformation requires a view from outside. The System of Profound Knowledge provides a view from outside, a theory to understand the organizations that we work in.
  - The theory of knowledge teaches us that a statement, if it conveys knowledge, predicts future outcomes with risk of being wrong, and that it fits without failure observations of the past.
  - A statement devoid of rational prediction does not convey knowledge. No number of examples establishes a theory, yet a single unexplained failure of a theory requires modification or abandonment of the theory.
  - There is no substitute for knowledge. Hard work, best efforts, and best intentions will not by themselves produce quality nor market.
  - Practice makes permanent, not perfect.
  - To copy an example of success, without understanding it with the aid of theory, may lead to disaster.
  - A rational plan, however, simple, is prediction concerning conditions, behaviors, performances of people, procedures, equipment, or materials.

Planning and The Deming Management Method

System of Profound Knowledge - Appreciation for a System

- **What is a system?** "A system is a network of independent components that work together to try to accomplish the aim of the system." "A system must have an aim. Without an aim, there is no system. The aim of the system must be clear to everyone in the system. The aim must include plans for the future. The aim is a value judgment. A system must be managed." "It is important that an aim never be defined in terms of a specific activity."
  - **Land Use as a System:** We often fail to recognize that land use planning and more specifically, the land use approval process is system that includes many components, factors, and participants.
  - **Components of the System:** Planning, zoning, subdivision, and wetland regulations. Applications/permits, markets, finances, and natural resources.
  - **Participants in the System:** Planners, commissions, residents, developers, land owners, and design professions.
  - **Factors to be Considered:** Market, infrastructure, access, land availability, return on investment, demand, timing, and consumer preferences.

Planning and The Deming Management Method

The Deming Method – Knowledge about Variation

- Variation is life; or life is variation. No two people are alike. Arrival of train or an airplane varies from day to day. Time en route to work varies day to day, no matter what be the mode of transport.
- Variation there will always be, between people, in output, in service, in product.
- What is the variation trying to tell us about a process, and about the people that work in it?
- The layman, however well educated but not learned in statistical theory, attributes every event to a special cause, unaware of the distinction between common cause of variation and special cause.
  - All planning issues; growth, development, sprawl, and preservation are subject to variation. However, how we as planners react to these issues and implement strategies for improvement of the system based on our interpretation of the causes of these issues, common cause and special cause variation.

Planning and The Deming Management Method

The Deming Method – Common and Special Cause Variation

- Deming writes here about his mentor: "Dr. Shewhart invented a new way to think about uniformity and nonuniformity. He saw two kinds of variation – variation from common causes and variation from special causes.
  - Common causes of variation produce points on a control chart that over a long period all fall inside the control limits. Common causes of variation stay the same day to day, lot to lot." Common cause variation is naturally occurring variation within a system.
  - "A special cause of variation is something special, not part of the system of common causes. It is detected by a point that falls outside the control limits." Special causes of variation are caused by something specific, special, and not part of the naturally occurring variation within the system

Planning and The Deming Management Method

The Deming Method – Common and Special Cause Variation

- "Dr. Shewhart also saw the two kinds of mistakes in attempts to improve results:
  - 1. To react to an outcome as if it came from a special cause, when it actually came from common cause of variation.
  - 2. To react to an outcome as if it came from a common cause, when it actually came from special cause of variation."
- Shewhart also introduced control charts and the need to plot points to identify common cause variation (a stable system) and special cause variation (an unstable system).

Planning and The Deming Management Method

The Deming Method – Psychology

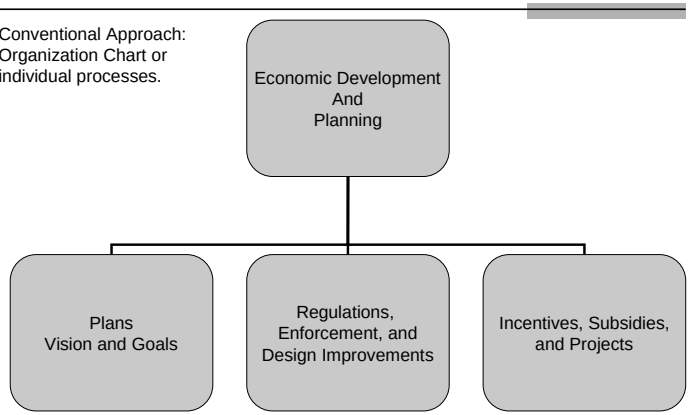
- Deming states, “Psychology helps us to understand people, interaction between people and circumstances.” “Management of industry, education, and government operate today under the supposition that all people are alike.”
  - A teacher, not wishing to penalize anyone unjustly, will pass a pupil that is barely below the requirement for a passing grade.
  - Fear invites wrong figures. Bearers of bad news fare badly. To keep his job, anyone may present to his boss only good news.
  - A committee appointed by the President of a company will report what the President wishes to hear. Would they dare report otherwise?
  - An individual may inadvertently seek to cast a halo about himself. He may report to an interviewer in a study of readership that he reads the New York Times, when actually this morning he bought and read a tabloid.
  - Statistical calculations and predictions based on warped figures may lead to confusion, frustration, and wrong decisions.

Planning and Land Use as a System

Planning and The Deming Management Method

Understanding Land Use as a System

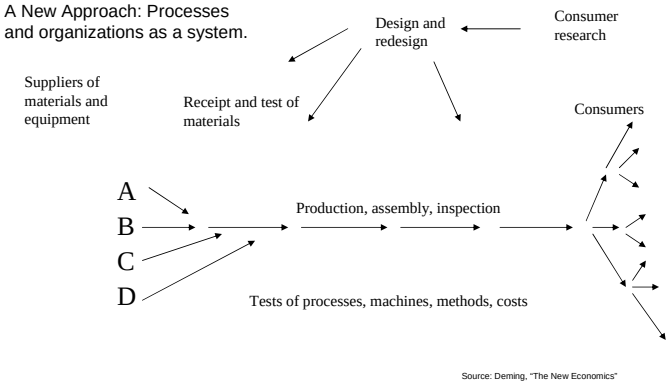
Conventional Approach: Organization Chart or individual processes.



Understand Planning and Development as a System

Deming Flow Diagram of a System—Not an Organizational Chart

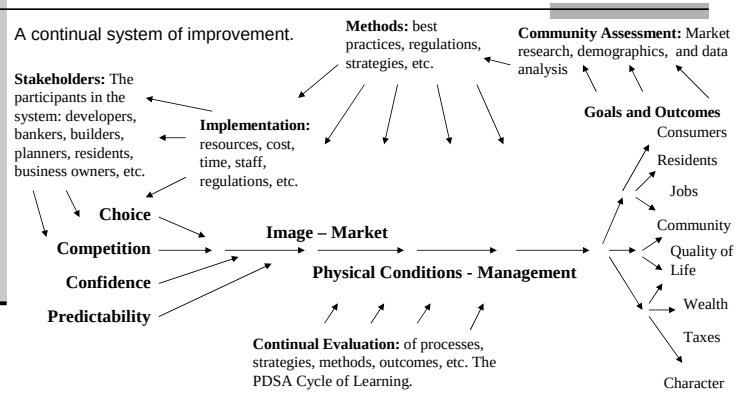
A New Approach: Processes and organizations as a system.



Source: Deming, “The New Economics”

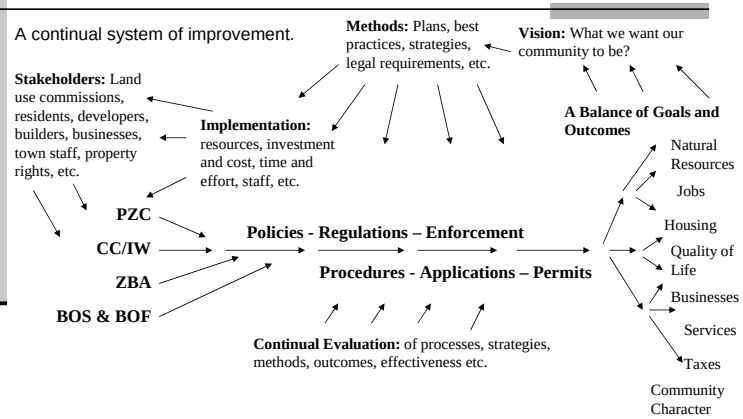
Understand Planning and Development as a System

The Planning and Development System as a Flow Diagram



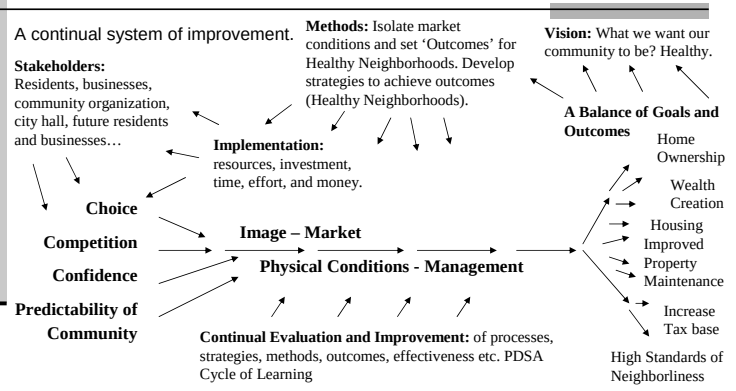
Understanding Land Use Administration as a System

Land Use Administration as a Flow Diagram



Understanding Community Development as a System

Healthy Neighborhoods as a Flow Diagram

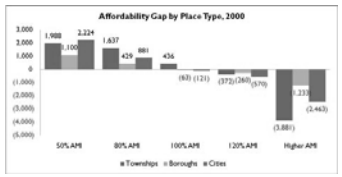


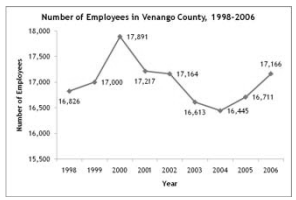
Utilizing and Understanding Data

Understand Planning and Development as a System

Understanding Data – Why Analyze data?

- Too much data
- Need to convert data to information (problem solving and decision making
- Need to "narrow" the problem

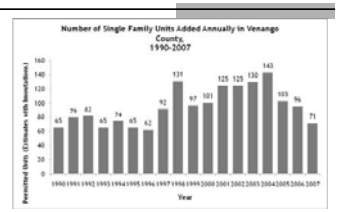




Understand Planning and Development as a System

Understanding Data – The Function of Planning Analysis

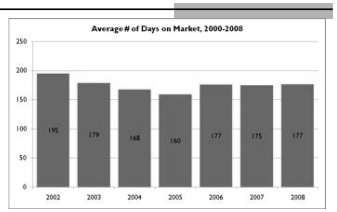
- Filter the data
- Simplify the problems
- Show patterns that help identify the solutions

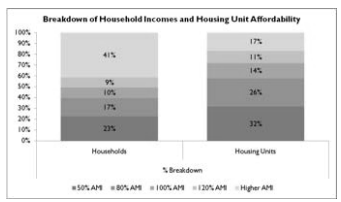


Understand Planning and Development as a System

Understanding Data – Using Tables and Graphs

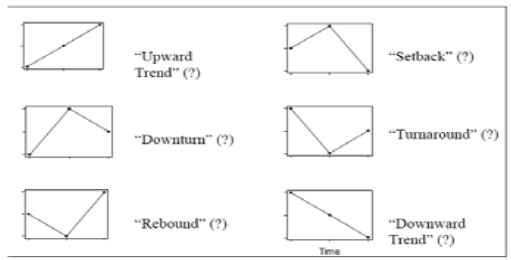
- Simplifying the data
- Visual representation of data
- Generally a single concept or comparative data should be addressed by each table
- Large and complicated tables should be relegated to an appendix
- Good for showing trends





Understand Planning and Development as a System

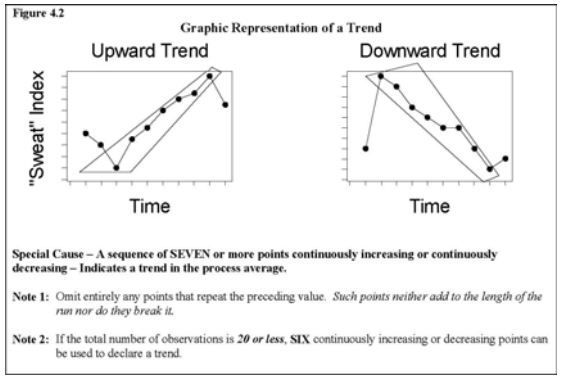
Understanding Data – What is a Trend?



- "So, how many data points does it "statistically" take to declare a "trend" with a low level of risk? Extending the concept presented above, it generally takes a run of length seven to declare a sequence a true trend."
- "Note that if the number of data points is 20 or less, a sequence of length six is sufficient. (By the way, should you ever have the luxury of having over 200 data points, you need a sequence of 8 to declare a trend.)"

Source: "Statistically Thinking"

Understand Planning and Development as a System
Understanding Data – What is a Trend?



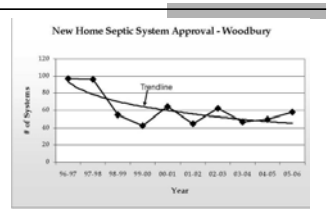
Special Cause – A sequence of SEVEN or more points continuously increasing or continuously decreasing – Indicates a trend in the process average.

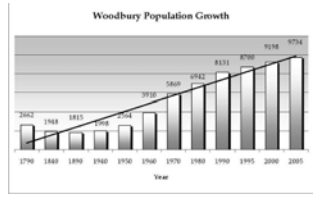
Note 1: Omit entirely any points that repeat the preceding value. *Such points neither add to the length of the run nor do they break it.*

Note 2: If the total number of observations is ***20 or less***, **SIX** continuously increasing or decreasing points can be used to declare a trend.

Understand Planning and Development as a System
Things to Understand when Analyzing Data

- What do these two charts tell us?
- Does the trend line in each match the data?
- Do they predict the future?
- Should we be careful when interpreting data?
- Should we be careful when assuming common or special causes?





Source: Woodbury Plan of Conservation and Development

Understand Planning and Development as a System
Things to Understand when Analyzing Data

- "Half of the people in any area will be above average for that area in tests of cholesterol."
- "There is no true value of any characteristics, state, or condition that is defined in terms of measurement or observation. Change of procedure for measurement or observation produces a new number."
- "Change the rule…you come up with a new number."
- "There is no such thing as a fact concerning an empirical observation."

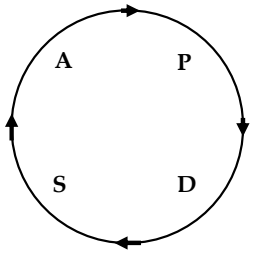
 Source: Woodbury Plan of Conservation and Development

The PDSA Cycle of Learning:
Plan – Do – Study – Act

How We Plan for Commercial Development

Plan – Do – Study – Act: The PDSA Cycle of Learning

4. **Act -** Adopt the change, or abandon it, or run through the cycle again.



1. Plan - a change or a strategy, aimed at improvement.

3. **Study -** the results. What did we learn? What went wrong?

2. Do - Carry out the change or strategy (preferably on a small scale)

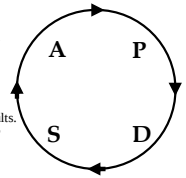
Planning should be flexible, continual, and ongoing process that we learn from.

A flow diagram for learning and for improvement of a product or of a process. Page 132, *The New Economics, 2ed.*

How We Plan for Commercial Development

PDSA Cycle of Learning – An Idea for Improvement

4. **Act -** Adopt the change, or abandon it, or run through the cycle again.



1. Plan - a change or strategy, aimed at improvement.

3. **Study -** the results. What did we learn? What went wrong?

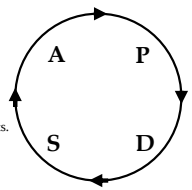
2. Do - Carry out the change or strategy (preferably on a small scale)

The PDSA Cycle of Learning and Improvement begins with and idea (a solution to an issue or problem—a means for improvement), this is the **0th Stage**. The Cycle of Learning and Improvement starts in the **Planning Stage** with consideration of the questions **"What are we trying to accomplish?" "What are the desired outcomes?"**

How We Plan for Commercial Development

PDSA Cycle of Learning – Stage 1. Plan

4. **Act -** Adopt the change, or abandon it, or run through the cycle again.



1. Plan - a change or strategy, aimed at improvement.

3. **Study -** the results. What did we learn? What went wrong?

2. Do - Carry out the change or strategy (preferably on a small scale)

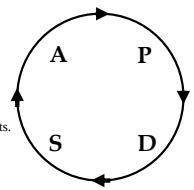
The Plan consists of four components:

1. **Improvement:** Changes or strategies that we can implement that (we predict) will bring about the improvement.
2. **Theory:** The reasons we believe these changes or strategies will bring about improvement. This includes any assumptions and the reasoning behind the assumptions. This is our theory, no matter how tentative it is.
3. **Prediction of Outcomes:** Prediction of what results we will get from carrying out the changes or strategies, based on our theory.
4. **Observation/Measurement:** A method of observation or measurement that can be used to see whether the actual results of carrying out the plan are as predicted.

How We Plan for Commercial Development

PDSA Cycle of Learning – Stage 2. Do

4. **Act -** Adopt the change, or abandon it, or run through the cycle again.



1. Plan - a change or strategy, aimed at improvement.

3. **Study -** the results. What did we learn? What went wrong?

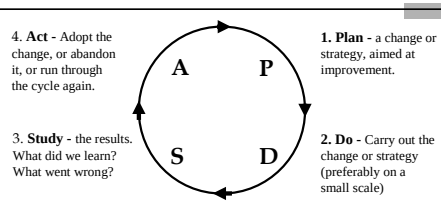
2. Do - Carry out the change or strategy (preferably on a small scale)

In the **Do Stage**, the planned changes or strategies are carried out and the results are observed or measured

1. **Implementation:** The implementation of the PLAN for change, the strategies developed in the Plan Stage.
2. **Observation/Measurement:** The observation and measurement of the PLAN implementation.

How We Plan for Commercial Development

PDSA Cycle of Learning – Stage 3. Study

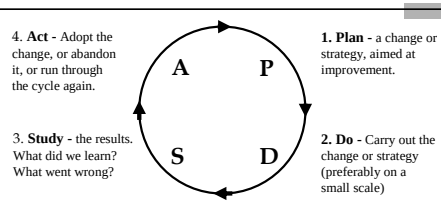


The **Study Stage** involves comparison of the results observed in the Do stage with the predictions made in the Planning stage. There are two possibilities:

1. **Theory/Prediction Failed:** The observed results of the implementation and predictions do not correspond. This provides an opportunity to learn since we have cause to revise the theory used as a basis for the plan and the mean of implementation.
2. **Theory/Prediction Worked:** The observed results of the implementation and predictions do correspond. We do not have cause to revise the theory used for the plan, which increases our degree of belief in the theory's usefulness.

How We Plan for Commercial Development

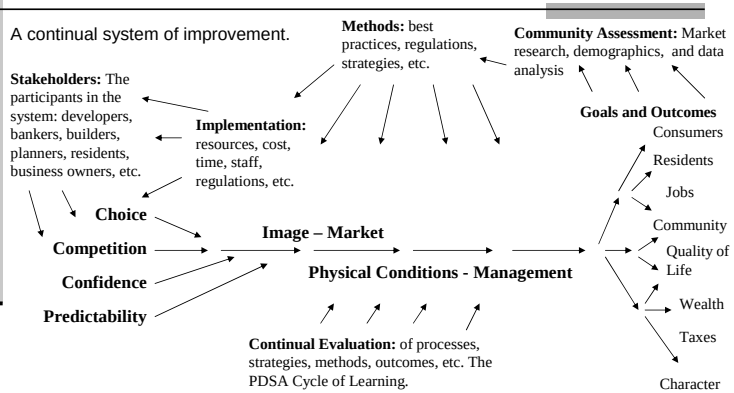
PDSA Cycle of Learning – Stage 4. Act



In the **Act Stage** the theory is revised (acted upon), if such a need were indicated in the Study stage, thereby providing a new foundation for any future cycles. If so, the next PDSA cycle starts with an answer to the initial questions of **"What are we trying to accomplish?" "What are the desired outcomes?"**

Understand Planning and Development as a System

The PDSA Cycle of Learning as a System of Improvement



Planning and The Deming Management Method

The Deming Method – Deming Applied to Planning and Plans

- "If people do not see the process, they can not improve it."
- A numerical goal accomplishes nothing. Only the method is important, not the goal. By what method?"
- "It is wrong to suppose that if you can't measure it, you can't manage it – a costly myth."
- "To copy is to invite disaster."
- "There must be a method to achieve an aim."
- "If you can accomplish a goal without a method, then why were you not doing it last year? There is only one possible answer: you were goofing off."
- "What we need is methods for improvement of the process."
- "No number of examples establishes a theory, yet a single unexplained failure of a theory requires modification or abandonment of the theory."
- "I may offer the suggestion that the presentation must describe a plan for action, with prediction of results. Acceptance and action on a great idea depends on simplicity and brevity in presentation."