

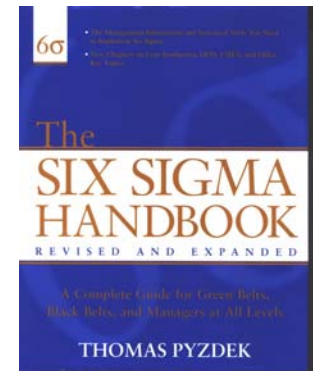
“The Red Bead Experiment”

A demonstration of futility found in many Management Systems



Author, *Six Sigma Handbook*

Materials provided by
The Pyzdek Institute



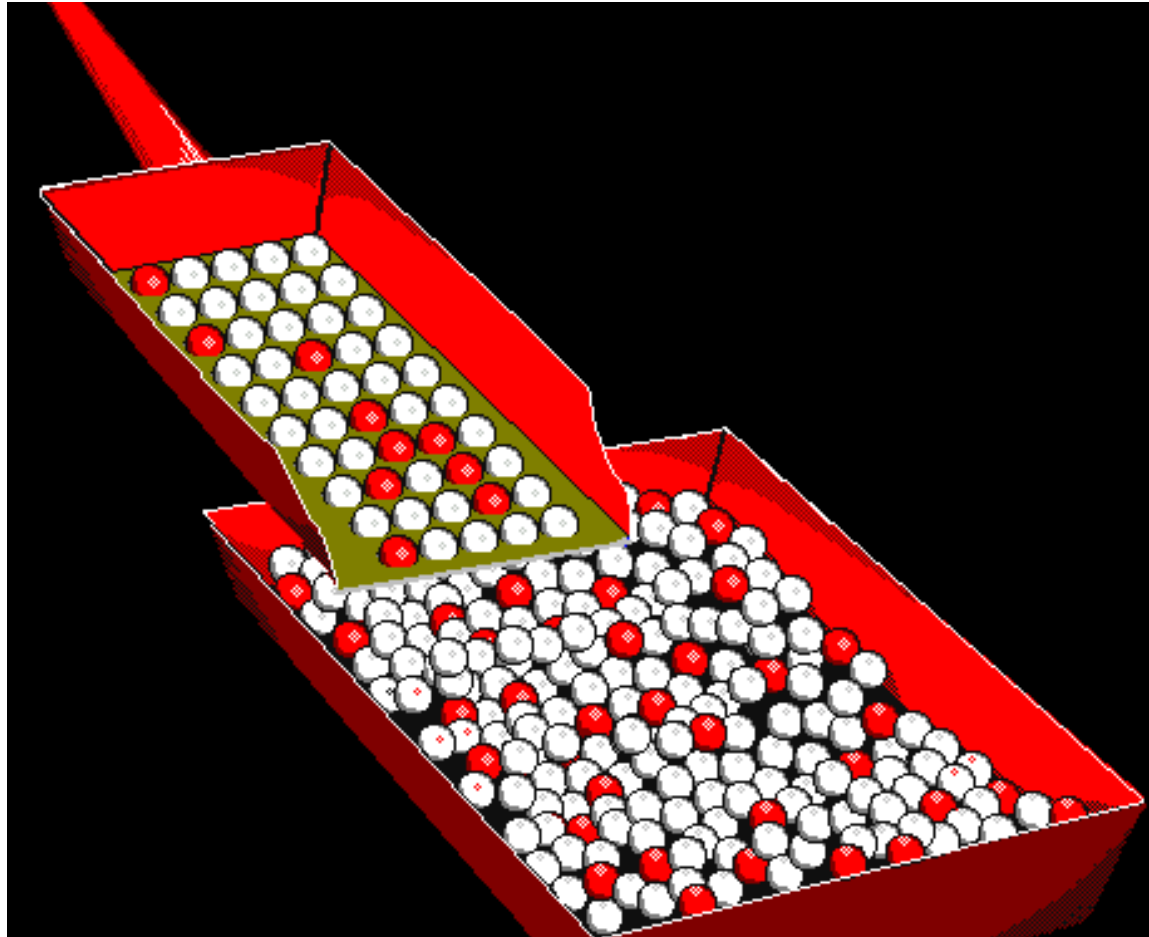


Demonstration Objectives

- Help you become a more effective leader
 - Begin the process of transforming you to running the business using modern tools and methods to maximize stakeholder value and minimize loss to society

Goal: No Red Beads!

- **Red Beads represent defects in the business process**
- All the things that can and do go wrong with a process



Help Wanted!

Vacancies, 8. Applicants must be willing to work.

- Educational requirements minimal.
- No experience required.



Staffing

- Four willing workers
- Two quality auditors
- One QA supervisor
- One analyst/recorder
- One boss (position not open)



Procedure

- Apprenticeship training
 - Stir thoroughly
 - Scoop a full paddle of beads
 - Carry paddle to auditor #1, record count
 - Carry paddle to auditor #2, record count
- QA supervisor compares counts, announces total
- Analyst/Recorder records counts
- At end of each day, boss assesses performance, coaches, and takes the appropriate action



Lot Size: 50 per worker per day

Name	Day				
	1	2	3	4	Sum
Sum					
Avg					



Results of Simulation

Each table will discuss the results of this simulation among themselves for five minutes. Then groups will share their insights and conclusions.

- Are there any similarities between the simulation and the real-world?
- Examples from your own experiences?



Statistical Analysis

- Six Sigma Black Belt will explain her/his analysis of the results.
- Discussion: How does the Black Belt's interpretation differ from the traditional approach?

Superstitious Learning

What do we learn when we react to random variation?

Superstitious Learning

APA CENTENNIAL FEATURE



'Superstition' in the Pigeon

B. F. Skinner
Indiana University

To say that a reinforcement is contingent upon a response may mean nothing more than that it follows the response. It may follow because of some mechanical connection or because of the mediation of another organism; but conditioning takes place presumably because of the temporal relation only, expressed in terms of the order and proximity of response and reinforcement. Whenever we present a state of affairs which is known to be reinforcing at a given drive, we must suppose

With the exception of the counter-clockwise turn, each response was almost always repeated in the same part of the cage, and it generally involved an orientation toward some feature of the cage. The effect of the reinforcement was to condition the bird to respond to some aspect of the environment rather than merely to execute a series of movements. All responses came to be repeated rapidly between reinforcements—typically five or six times in 15 sec.

The effect appears to depend upon the rate of reinforcement. In general, we would expect that the shorter the intervening interval, the

An experiment was conducted to study responses to random rewards



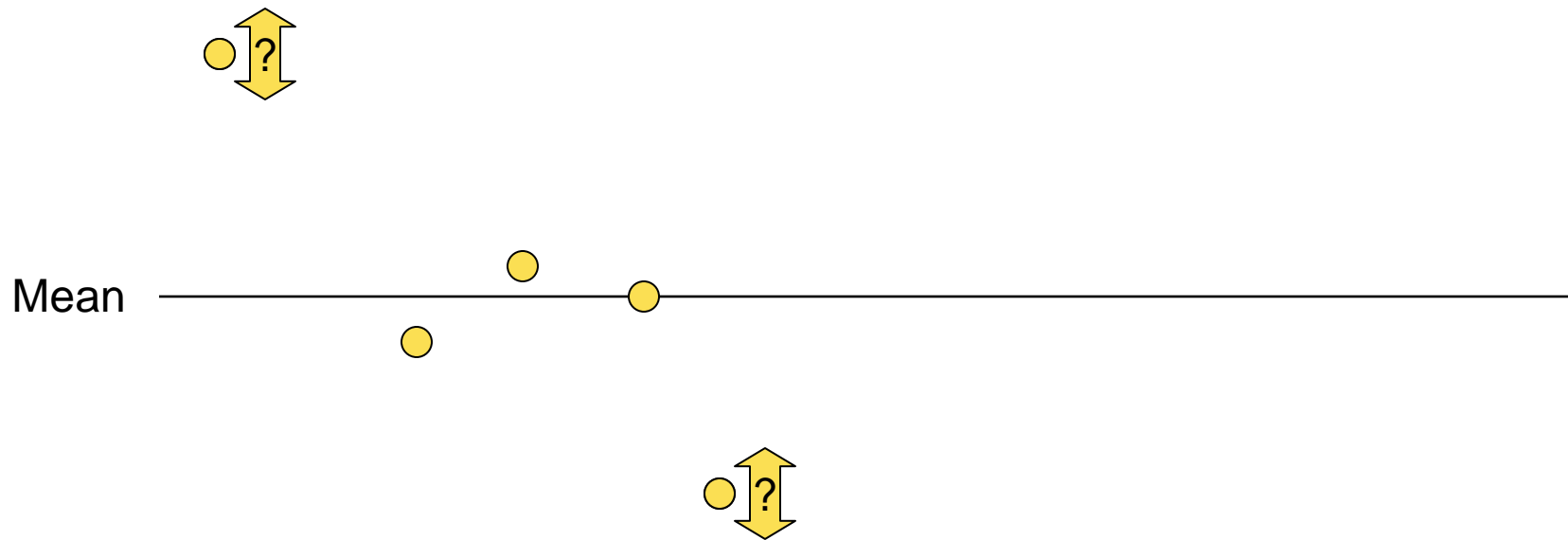
Details and Results

- A pigeon is given a reward at a random time, with no reference to its behavior
- Birds tended to repeat what they were doing when they received the reward
 - Turning, twisting, flapping, jumping, etc.
- Responses persisted
 - After rewards were stopped, more than 10,000 responses were recorded before extinction
- When rewards resumed, different responses appeared

Learning occurred even when no learning was intended

Regression and Learning

- Statistical fact
 - A value far from the mean is usually followed by a value nearer to the mean





Discussion Topics

- A manager reacts when an employee's performance is poor...
 - Assuming the manager's action has no effect, is the next result likely to be better, worse, or the same?
 - What are employees likely to learn?
 - What is the manager likely to learn?
- Open discussion: What are some real world examples in your organization?