Gunfire at Sea - A Case Study of Innovation

- **Initial Problem with Naval Gunnery (pre-1898)**
  - Ships rolled constantly, making accurate gunfire extremely difficult.
  - Gun pointers had to estimate range and fire at the right moment in the ship's roll.
  - Each pointer had a personal "firing interval" (reaction delay), leading to inconsistent accuracy.
  - Accuracy was poor: in 1899, five U.S. ships fired for 25 minutes and only scored two hits at 1600 yards.
- **The Innovation – Continuous-Aim Firing (1898–1900)**
  - Admiral Sir Percy Scott (Royal Navy) observed one gunner unconsciously adjusting for ship roll.
  - He realized gunners could be trained to continuously adjust aim during the roll, rather than waiting for a "perfect moment."
  - Technical changes included:
    - Re-gearing elevation mechanisms for faster adjustment.
    - Mounting telescopic sights to avoid recoil damage.
    - Creating daily practice routines with moving mock targets.
  - Result: gunners shifted from being "artists" to "technicians," producing uniform accuracy.
- **Diffusion into the U.S. Navy**
  - American officer William S. Sims learned the method from Scott in 1900.
  - Sims modified U.S. ship equipment and proved the system with strong results.
  - He wrote 13 reports (1900–1902) to Navy leadership, documenting data, equipment needs, and successes.
- **Resistance to Adoption**
  - Stage 1: Silence. Reports ignored, some literally left to be eaten by cockroaches.
  - Stage 2: Rational Rebuttal. Bureau of Ordnance argued U.S. equipment was as good as British and continuous-aim firing was impossible based on flawed land-based experiments.
  - Stage 3: Attack. Sims was dismissed as a "crackbrained egotist" and "deliberate falsifier."
  - Navy leaders resisted because:
    - Sims was a junior officer criticizing senior engineers.
    - The old system had "worked" in the Spanish-American War.
    - Adoption threatened entrenched routines, authority, and even career paths.
    - Continuous-aim firing implied major changes in ship routines, tactics, and even ship design.
- **Breakthrough with External Support**
  - Frustrated, Sims bypassed Navy leadership and wrote directly to President Theodore Roosevelt.
  - Roosevelt appointed Sims Inspector of Target Practice (1902), forcing adoption.
  - This changed U.S. gunnery culture: gunnery officers gained status, ship design and tactics shifted, and accuracy dramatically improved.
- **Deeper Lessons on Innovation and Resistance**
  - Innovations disrupt not just technology but social structures and power dynamics.
  - Resistance came from fear of losing relevance, protecting traditions, and preserving "home" (ships, routines, authority).
  - The Navy only changed when an outside authority (the President) intervened.

Discussion Questions & Business Lessons

Why did it take the U.S. Navy so long to adopt constant-adjustment techniques?

- Entrenched bureaucracy: Reports were ignored at first due to organizational inertia.
- Hierarchical culture: Sims was a junior officer challenging senior authority, making his ideas easy to dismiss.
- Flawed logic: Leaders clung to incorrect experiments and past war outcomes that suggested the old system was "good enough."
- Identity protection: Accepting new gunnery methods meant reshuffling roles, prestige, and promotions, threatening the existing social order.
- Fear of disruption: Continuous-aim firing implied major changes in ship routines, tactics, and even ship design.

What does this tell us about adopting innovations in organizations?

- Innovation is not invention. The technology (guns, sights, gears) already existed; what mattered was new integration and training.
- Resistance is social, not technical. People resist change to protect identity, routines, and power, not because the idea lacks merit.
- Evidence is not enough. Data and reports often fail to overcome resistance; persuasion and power matter more.
- Champions are required. Sims acted as an entrepreneurial change agent, pushing beyond his formal role.
- External authority is sometimes necessary. Transformation may require support from outside the entrenched system (for example, Roosevelt).

- Change creates winners and losers. Innovations shift status and influence, so organizations often resist until benefits outweigh perceived threats.
- Lesson for business: When pushing new ideas, expect organizational inertia, build alliances, frame benefits in social as well as technical terms, and if necessary, seek external sponsorship.