BOOK CONSERVATION TECHNIQUES AS A KEY ELEMENT OF TOTAL QUALITY MANAGEMENT (TQM) IN LIBRARIES

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Abstract :

The paper discusses about variety of methods used in book conservation to maintain the books' chemical and physical integrity so that they last a long time and are always available. Surface cleaning, deacidification, humidification and flattening, mold and pest management, and physical repairs with archival materials are important conservation techniques. These methods are intended to preserve historical authenticity and, when feasible, reversibility while stabilizing books that have been impacted by physical damage, age-related deterioration, or environmental variables. In order to prolong a book's life, preventive conservation measures including regulating temperature, humidity, and light exposure are essential.

Introduction :

Books are essential historical, archaeological, and educational treasures that must be properly cared for to maintain their physical and informational validity over time. Books deteriorate due to a variety of circumstances, including age, weather conditions, handling, and the use of acidic chemicals in creation. Conservation procedures strive to limit or prevent degradation, so that books are available to future generations.Book conservation is a specific subject of preservation that includes both preventive measures (such as maintaining optimal storage conditions) and interventional activities (such as cleaning, deacidification, repair, and stability of damaged materials). These approaches are founded on scientific concepts and employ non-invasive, reversible, and archival-quality materials. While some simple techniques can be safely performed by anyone, more complicated treatments require the expertise of professional conservators.

Keywords : deacidification, humidification, flattening,

Literature review :

Preventive Conservation :

Authors such as Paul Banks and Roberta Pilette (2000) have emphasized environmental control as an important preventive measure. Their study in Preservation: Issues and Planning discusses how temperature, humidity, light, and contaminants accelerate paper deterioration. According to studies, keeping paper materials around 18-21°C and 30-

50% RH increases their lifespan significantly (NISO, 2003).

Deacidification Research :

Barrow (1965) was among the first to investigate the effects of paper acidity and advocated the use of alkaline buffering agents. More recent inventions, such as the Bookkeeper Spray and Wei to systems, provide non-aqueous deacidification solutions suitable for both bulk treatments and individual books.

Foundational Works and Historical Approaches :

Cockerell's Bookbinding and the Care of Books (1901). These techniques paid little regard to long-term preservation or chemical breakdown, instead emphasizing artistry. But as time went on, the focus of the field changed from restoration to conservation, emphasizing the use of archival-quality, reversible materials and minimal intervention.

Book Preservation Methods :

Cleaning the Exterior (Covers and Book Edges) :

Keep the book tightly closed. Dust should be gently brushed using a soft brush: Starting at the upper margin (pages), Along the back, In and around the covers that aren't made of cloth, such leather, vinyl, or plastic Use a dry microfiber cloth to gently wipe. For stubborn dirt on leather, seek professional advice; make sure leather conditioners are archival-safe before using them. For Paper or Cloth Covers Gently rub dry vinyl eraser or smoke sponge on stained areas. To make sure the material won't lift or smudge, start by testing a small corner.

1. For Leather Covers

Chemical/Product	Purpose	Notes
Saddle soap	Gentle cleanser for leather	Use very sparingly and only on real, finished leather. Not recommended for rare books.
Klucel-G (Hydroxypropylcellulose)	Leather consolidant and cleaner	Mixed with isopropyl alcohol; used by conservators to stabilize dry or flaking leather.
SC6000 Leather Dressing (British Museum formula)	Reconditions and protects leather	Use only if leather is **not red rot**-damaged. Apply sparingly.
Isopropyl alcohol (70% or higher)	Solvent for specific cleaning tasks	Used as a carrier for Klucel-G; not for general cleaning. Use with extreme caution.

2.For Vinyl, Plastic, or Modern Coated Covers :

Chemical/Product	Purpose	Notes
Mild detergent solution (1–2 drops of pH-neutral soap in water)	Removes surface grime	Dampen a microfiber cloth lightly—never soak the cover. Test a small area first.
Isopropyl alcohol (70%)	Spot-cleaning sticky or greasy marks	Use sparingly with a cotton swab. Avoid printed areas. Not for older or fragile materials.
Vulcanized rubber sponges (smoke sponges)	Dry-cleaning plastic-coated or glossy surfaces	Gently rub to lift dirt without moisture. No residue left behind.

For Cloth Covers :

- Cloth is porous and easily damaged by liquids, so chemical use is discouraged.
- Use dry methods: smoke sponge, soft erasers, or brushes.
- For ingrained grime or mildew stains: Use a dry cleaning pad (contains powder that absorbs dirt).
- Do not apply water or alcohol—can cause dye bleeding or warping.

Cleaning the Interior (Pages) :

1. The process of deacidification :

The process of neutralizing the acids in paper to stop or slow down deterioration is called deacidification. This is particularly crucial for books printed on wood pulp-based paper, which became popular after the 1850s but eventually turns brittle and yellow from the acidic content.

When to Deacidify ?

- Paper is brittle, yellowing, or has a pH below 6.0
- The book is important to preserve but not so rare it should only be handled by professionals
- The pages are not coated (e.g., glossy) and can absorb treatment

Common Products for Deacidification

Product	Type	Features
Bookkeeper Spray	Aerosol	Non-toxic, leaves alkaline buffer
Wei T'o Spray	Aerosol	More advanced, neutralizes and buffers
Archival Mist	Aerosol	Marketed for photos and documents
Pre-made Deacidification Pads	Dry	Rubbed on paper, light buffering effect

2. Humidification & Flattening of Books and Paper :

Without causing any harm to the material, this technique is used to gently relax and flatten pages and covers that are bent, crumpled, or wrinkled in books or documents. Items that have been folded, rolled, or exposed to moisture benefit greatly from it.

Method: Humidity Chamber

1. **Set up the chamber:**
   - Use a plastic storage box with a tight lid.
   - Place a **wet sponge or towel** (damp, not dripping) on the bottom.
   - Place a **rack or mesh screen** above the sponge to keep the book/pages from touching the water.
2. **Place the book or paper:**
   - Lay the item **flat** on the rack.
   - Ensure the pages are **not touching one another too tightly** (fan slightly if needed).
3. **Seal the container:**
   - Close the lid and let it sit for **2 to 8 hours**, depending on the paper thickness and curl.
   - Check every 30 minutes to avoid over-humidification.

Method: Flattening :

After humidifying :

- **Remove the book/paper** carefully.
- **Place between blotting paper or unprinted newsprint** (one sheet above and below).
- **Apply light, even pressure** using flat boards and weights (e.g., heavy books).

- **Change blotting paper daily** to prevent moisture buildup.
- Leave underweight for **1–3 days** until fully dry and flat.

3. Dealing with Mold or Mildew on Books

When books are kept in humid, poorly ventilated conditions, fungi called mold and mildew can grow on them. Sometimes it is safe to handle early-stage (mild) cases at home, although care must be taken to prevent spore spread or book damage.

Recognizing Mold or Mildew

Indicator	Description
Odor	Musty, damp smell (often the first sign)
Appearance	Light powdery white, gray, or green spots on pages or covers
Texture	Dry to the touch (active mold is often fuzzy or damp)

4. Cleaning Dry Mold :

Isolate the Book :

- Place the book in a dry, well-lit, ventilated space.
- Keep it away from other books to prevent mold spread.

Dry It Out :

- Let the book air-dry for 24–48 hours in low humidity (30–40% RH).
- Use a fan (not directly on the book) to promote airflow.

Brush Off Mold :

- Put on gloves and a mask.
- Use a soft brush to gently remove mold spores, brushing away from the spine.
- Work outside or over a trash bag to collect debris.

Disinfect Hard Surfaces :

- For covers (not pages), use a cotton swab dampened with 70% isopropyl alcohol.
- Lightly dab or wipe moldy areas — avoid rubbing too hard.

How Book Conservation Supports TQM in Libraries :

1.Service Quality :

By keeping books in useable condition, conservation practices raise the standard of the library's collection as a whole. A key component of TQM objectives is user happiness, which is enhanced by well-maintained books.

2. Durability of Materials :

Libraries can lessen the need for regular replacements by putting systematic conservation methods into place. This promotes cost-effective resource management, which is a fundamental TQM tenet.

3. Constant Improvement :

A TQM-driven philosophy of continuous evaluation and improvement is seen in the routine maintenance and monitoring of books' physical condition. As new materials and techniques become available, conservation policies are modified.

Method of Research :

This paper is totally based on observation method and open accessible material available on internet

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