



Gravure Summit

Gravure at a Crossroads

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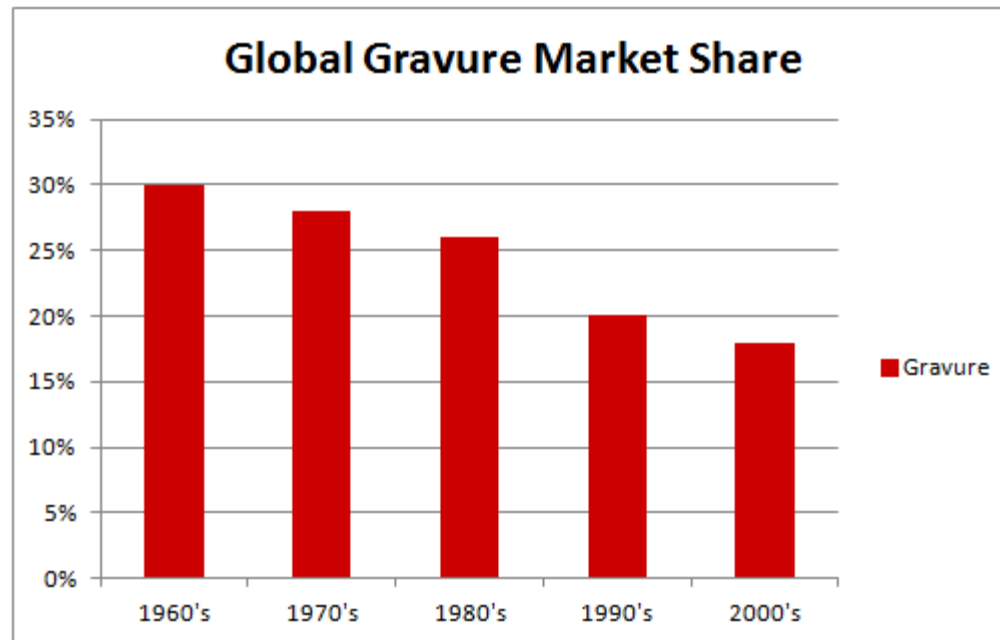
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Long Term Share Decline (Graphic Arts)

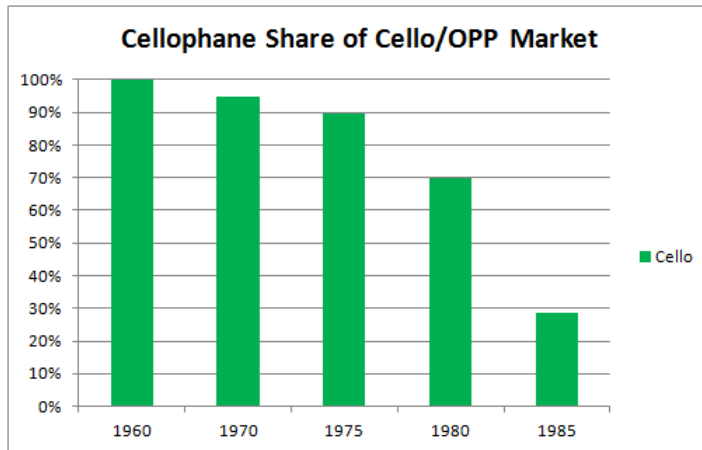


Source: Ecker, Overview of Gravure Printing Technology, Jul 04, SpecialChem

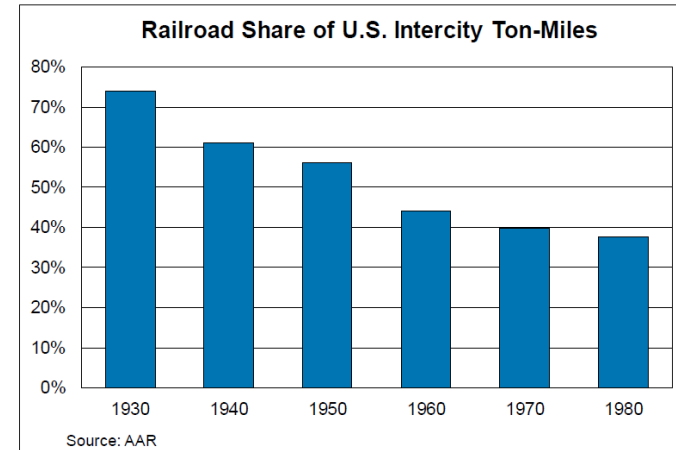
- Despite its many strengths, gravure's share of the Graphic Arts market has been declining for five decades.



Not Unique To Gravure



Source: Mumbai Mirror, Oct 4, 2010, BOPP Film on a Growth Path



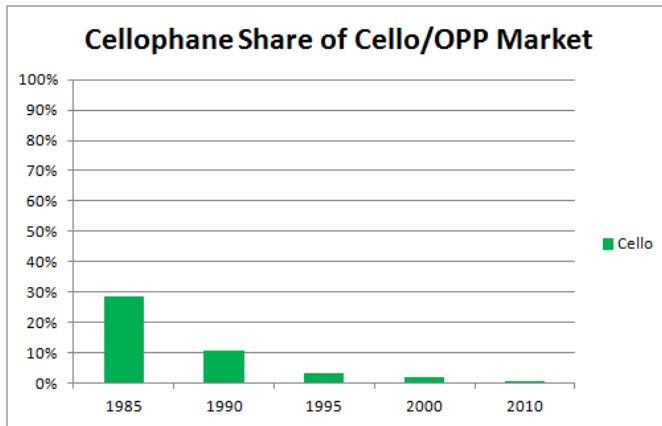
Source: AAR

Source: AAR, May 2015, A Short History of US Freight Railroads

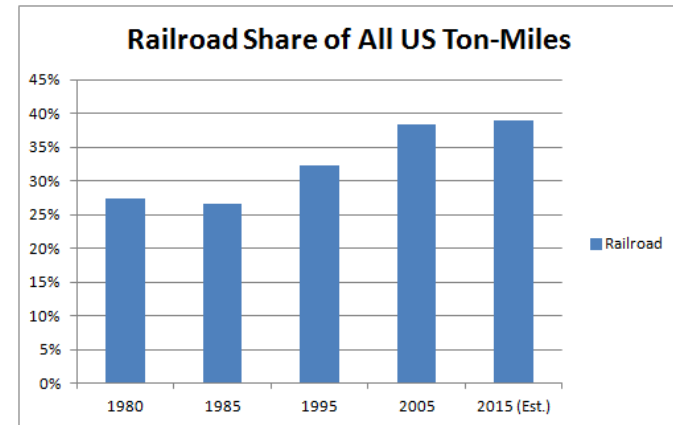
- Long term share declines are a common story in industry.
- Nevertheless, stories with similar beginning can have very different endings.



Similar Beginnings – Different Endings



Source: Mumbai Mirror, Oct 4, 2010, BOPP Film on a Growth Path



SOURCE: U.S. Department of Transportation, Research & Innovative Technology Administration, Bureau of Transportation Statistics.

- After decades of declining share:
 - The Cellophane Industry retreated to a highly profitable niche, but ...
 - The Rail Freight Industry reinvented itself and ignited new growth.
 - Nearly 3x growth in ton-miles (660 Bn in 1980; ~1850 Bn in 2015).
 - Market share increased from 27% in 1980 to 39% today.



The Crossroads

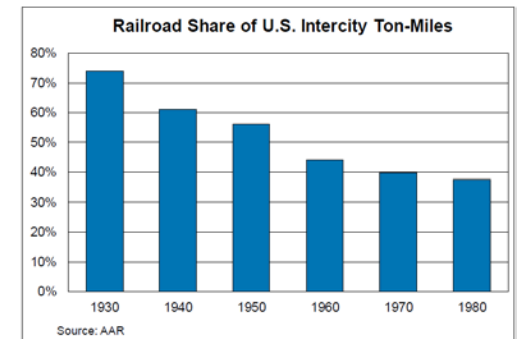


- Gravure is at a crossroads. It can either:
 - Retreat to applications where it has a sustainable competitive advantage, or ...
 - Reinvent itself and reignite growth.
- Retreat is easy to understand:
 - Find applications where your technology is uniquely advantaged.
 - Restructure to be profitable in these applications.
- Reinvention is a more difficult path.



Working on the Railroad – Root Cause

- Government Regulation
 - Prohibited from setting prices or abandoning routes.
- Subsidized Competition
 - Trucks use public highways; Railroads build railways.
- Business Model
 - Adversarial: Trucking is “Public Enemy #1”.
- Productivity
 - Railroads grew fat in a regulated environment.
 - Unions negotiated crippling work rules.
 - Productivity improvement lagged other industries.



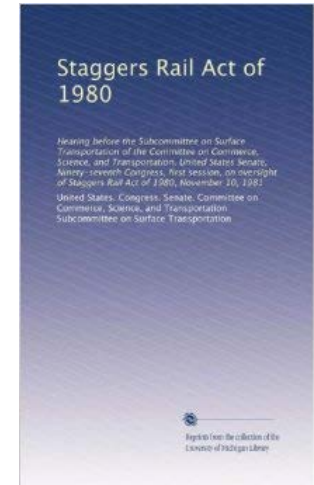
Source: AAR, May 2015,



Working on the Railroad – Cure

■ Government Regulation

- 1970: PennCentral bankruptcy; the government wakes up.
- 1971: Rail Passenger Service Act - Amtrak formed.
- 1976: Conrail - 6 east coast RRs become wards of the state.
- Mid-70's: Effective railroad lobbying results in suspension of the ICC's power to prevent route abandonments.
- 1980: Staggers Act deregulates the rail industry.



Staggers Act

■ Subsidized Competition

- No change.
- Public spending on Highways: \$156 Bn (Fed, State, Local).
- Public spending on Interstate Rail: \$1.3 Bn (Fed).
- Amtrak subsidy: \$0.3 Bn.



Subsidized Roads



Working on the Railroad – Cure

■ Business Model

- From Adversarial to Collaborative: Intermodal Freight
- Rail and trucking grow at the expense of barges and pipelines.

■ The Reality of the Change

- 1981: Burlington Northern (BN) intermodal team formed.
 - Intermodal services (piggybacking) are rare and seldom offered.
 - Proud railroad traditionalists meet entrepreneurial truckers.
- 1982: The intermodal team threatens the status quo.
- 1982: Two hub pilot approved - Midway, MN to Portland OR.
 - Launch date set: January 83 (middle of winter, deep recession)
 - BN top management set up its own team to fail
- 1990: BN total revenue - \$4.5Bn. Intermodal revenue - \$1.0Bn.



Fast! Reliable! That's Great Northern's
PIGGYBACK FREIGHT SERVICE
Piggyback Freight



Transloading Containers



Working on the Railroad – Cure

■ Productivity

- Railroads achieved a 5x improvement in ton-miles per employee between 1980 and 2005.
- Initially, the productivity growth was driven by the adoption of best practices.
- Over the long haul, new technologies were the engine of sustained productivity growth:
 - Technologies like Computerized Planning and Operations Systems could be developed company by company.
 - The cost and risk of developing others, like heavy duty rail, could not be born by any single railroad.
 - Railroads joined forces to develop new technologies that would be used by all railroads, to their mutual benefit.



Company Initiative: BNSF
Computerized Planning System



Industry Initiative: Heavy Duty Track



Working on the Railroad – Cure

■ Cooperative Development

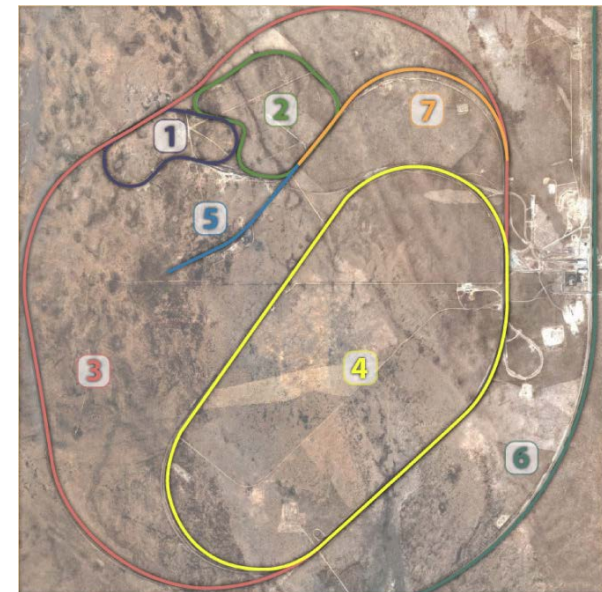
- The problem with technologies like heavy duty rail is:
 - It takes millions of ton-miles to precipitate failure.
 - Failure modes can be totally unexpected.
 - The consequences of failure can be catastrophic.
- The solution was a dedicated test facility.

■ American Association of Railroads (AAR)

- The AAR played a vital role in enabling cooperative development.
 - It lobbied for the creation of a dedicated test facility, the Transportation Technical Center (TTC).
 - Today, AAR members set the TTC research agenda, fund TTC operations, and share the benefits of new technologies.



American Association of Railroads Logo



Transportation Technical Center Sitemap



Lessons for Gravure

- Even hopeless starting points do not preclude the possibility of transformative change.
- The first step in the transformation was simply to implement best practices.
- Sustained improvement required transformative new technologies.
- Industry collaboration sped development of technologies which were used by all, to the benefit of all.
- The transformation depended on increasing value (Intermodal) and reducing cost (Productivity).


Research Agenda

- Quantify the gap between typical practice and best practice. Make this opportunity visible to the industry.
- Document opportunities for transformative breakthrough enabled by new technologies.
- Estimate the value print buyers place on gravure by market segment.



Gravure Manufacturing Survey

- Objective: Quantify typical and best manufacturing performance.
- Mechanism: A jointly sponsored (GAA/Gravure Research Chair) survey of industry performance.
- Risk Management:
 - The survey tool is configured to protect the identities of participants.
 - Even the researcher will be unable to link individual participants to the survey answers they submitted.

GRAVURE RESEARCH CHAIR AMERICA  Gravure Manufacturing Survey

Welcome

Thank you for participating in the Gravure Manufacturing Performance Survey. This is an Anonymous survey. Collection of respondent addresses (email and IP) has been disabled, so the link between you and your responses has been permanently severed.

You do not have to complete the survey in one sitting. You can exit at any time by closing your Internet browser. When you want to continue, simply click the link in your invitation email. The survey will remember your previous responses. You can go back and edit a previous response at anytime before the survey is closed.

The survey is designed to present only those questions which are relevant to you, in the units of measure you prefer. The first few questions are used to tailor the remainder of the survey.

Please use the "Previous" and "Next" buttons in the survey to navigate between questions. Using the "Back" button in your Internet Browser will cause the data you just entered to be lost.


1 What units of measure do you use when reporting manufacturing performance information?

English units (feet, pounds, etc.)

Metric units (meters, kilograms, etc.)



How The Survey Works

GRAVURE AMERICA  Gravure Manufacturing Survey

Wide Web Packaging (English Units - 3)

* 7 Benchmark: How long does it take (in min) to set up a CMYK + 2 Spot Color Job on your best wide web packaging press?

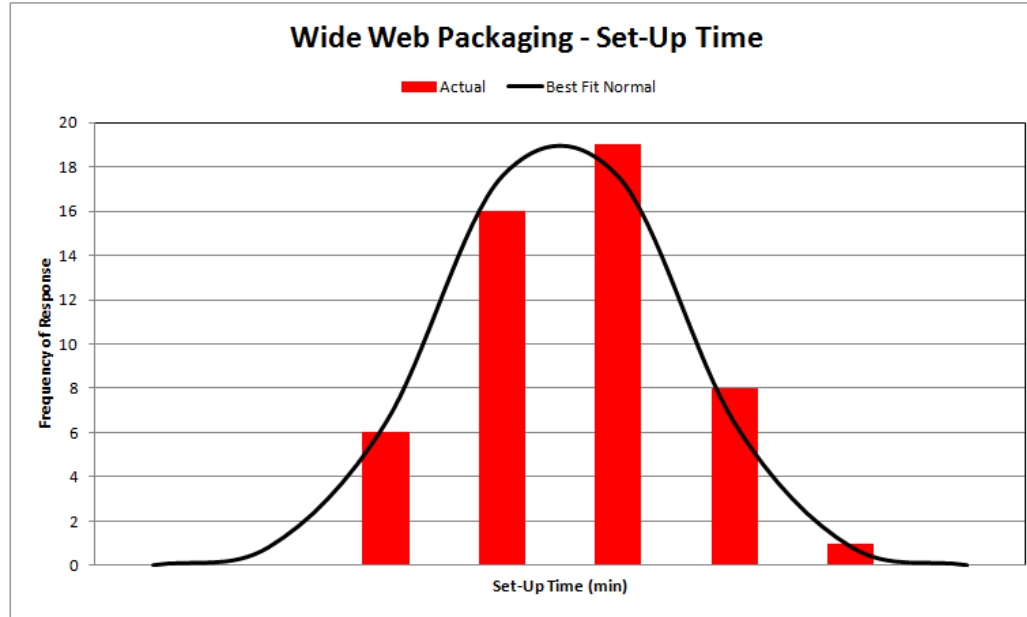
* 8 Benchmark: How much waste (in feet) does this set up generate?

* 9 Benchmark: What set up technology does your best press use?
 Cart System
 Automated Cylinder Mounting System
 Manual Cylinder Mounting System
 Other (please specify)

- For most participants, taking the Gravure Manufacturing Survey entails answering 22 questions.
- Each participant chooses the manufacturing category or categories relevant to his or her business.



Presentation of Results



- Results will be presented as distributions of responses.
- For large enough samples, best fit statistical distributions will be added.
- Key differences will be tested for statistical significance.



Dissemination of Results

- All members will receive an electronic copy of the research report.
- The results will be published and in the public domain.
- All data is anonymous. The link between you and the data you submit has been permanently severed.