CPET 575 Management Of Technology

Internal Corporate Venturing

Case III-7
R.R. Donnelley & Sons: The Digital Division,
by Artemis March

References:

Paul I-Hai Lin, Professor
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Prof. Paul Lin

R.R. Donnelley & Sons

  - Founded nearly 150 years ago
  - Corporate Office, Chicago, IL
  - 1995 (case study reporting time):
    - $4.9 billion revenue, 41,000 employees in 22 countries
  - 2014
    - A Fortune 500 company, employs 55,000 people in 40 countries across the globe
    - Corporate Office, Chicago, IL
    - Full-year 2013 Net Sales: $10.48 billion

Prof. Paul Lin

- Publishing and Retail Services
  - Magazines, Catalogs, and Retail Inserts
  - Books
  - Directories

- Variable Print
  - Commercial and Digital Print
  - Direct Mail
  - Labels
  - Statement Printing
  - Forms
  - Office Products

- Strategic Services

- International


- Publishing and Retail Services

- Variable Print

- Strategic Services
  - Logistics
  - Financial
  - Digital and Creative Solutions
  - Sourcing

- International
  - Asia, Latin America, Business Process Outsourcing, Europe, Global Turnkey Solutions, Canada
R.R. Donnelley & Sons

  - Products
    - **Print solutions**: Book, Business Communication Services, Business Forms, Catalog, Commercial Print, Direct Mail, Directories, Financial Services, Labels & Packaging, Magazine, Managed Print Services, Print on Demand, Retail Insert, Security Solutions, Variable Data Print
    - Digital solutions:
      - Supply chain solutions
      - Industry solutions

R.R. Donnelley & Sons

  - Products
    - Supply chain solutions
    - Industry solutions
R.R. Donnelley & Sons

  - Products
    - Print solutions
    - Digital solutions
    - Supply chain solutions:
      - Global Supply Chain Management
      - Print Fulfillment
      - Logistics
      - CustomBuy Supplier Management System
  - Industry solutions

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R.R. Donnelley & Sons: The Digital Division

- RR Donnelley (in early 1990) competed through
  - Large capital investments in offset and gravure presses (several million dollars), Long standardized runs, Multi-year contracts, and Dedicated plants

- Concerns (in 1995)
  - Sign on to the “Strategic potential of digital technology”?
  - Accept the “Digital Division” as the most appropriate locale for the business?
  - Digital printing – a technology in search of a market
  - Embrace digital printing? (do so on their own)

- Decision on Book Publishing Services business group
  - To move into “Digital Technology” on its own, OR
  - To bring its digital work to the Digital Division

- In the process of launching a new business “Four-Color Digital Printing” which allows for
  - Rapid response and customization
  - Economically desirable for runs of less than several thousand units,
  - Requires presses that cost $200,000 rather than several million dollars, and
  - Cutting-edge technology
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R.R. Donnelley & Sons: The Digital Division

- Organization of Case Sections
  - Company and Industry Background
  - The Digital Vision
  - Reengineering the Technology Development Process
  - From Vision to Reality
  - Building the Division
  - Challenges of Internal Acceptance

Company and Industry Background

- Organization and Incentives
- The Traditional Print Business
- Industry Shifts and New Technologies
- Industry Shifts ...
  - Moving increasingly toward such local, targeted communication called "Mass Customization"
  - TV Guide – wanted shorter runs, more versions, tailored inserts, and greater use of color
  - Microsoft – speed, simultaneous global distribution, and ability to revise material quickly
  - All customers faced
    - Sharply rising postal rates and paper prices
    - Increased inventory, warehousing, and shipping costs
  - Creating incentives to develop alternative
    - Electronic Media, and New Channels of Distribution
Company and Industry Background

- Industry Shifts and New Technologies

New Technologies ...

- Imaging technologies
- Desktops publishing
  - Stripping, color correction, etching ..migrated to the hands of the document creator
- Filmless printing technologies
  - Digital four-color, Computer-to-plate
  - Reduce cycles and chemical pollution

Emerging Competition

- Threats – new technologies and new entrants to the business
- Online service providers and software packagers
  - Making four-color images available electronically
  - Color printers (good quality) – for home and small businesses

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R.R. Donnelley & Sons: The Digital Division

The Digital Vision

- Formed by Rory Cowan to focus the company’s attention on the opportunities of “Digital Technology”
- Joined Donnelley in 1986
- Named Service Vice President of Sales for Documentation Services (renamed Global Software), in 1987
- Global Software served companies such as Microsoft, Apple, and IBM – reproduction and distribution of technical documentation in a variety formats, worldwide.
- Cowan attempted to build his new business in parallel with the old (not directly challenging the traditional organization and values); Like IBM in 1983 – PCs are coming, but management has grown up in mainframe world
Case III-7
R.R. Donnelley & Sons: The Digital Division

The Digital Vision … A New Business Model

- **Digital presses** were an *essential enabling technology*, but were unlikely, by themselves, to provide Donnelley with enduring “competitive advantages”
- Economies of scale would come from an “**Information Architecture**” that linked Donnelley with “Upstream Owners” and “Downstream Customers”
- Donnelley would become an “**electronic warehouse and distributor**,” with the critical ability to “print on demand”

New Business Model & Process

- Publishers => manuscripts (data files) => Donnelley => Database
- Publishers received orders from bookstore => contact Donnelley =>
  Print the book files (**anywhere in the world**) => Bound => Ship
- Donnelley => send a royalty check to the publisher

Competitive Advantages

- **Eliminate a range of costly steps** (60% of publishers’ cost): warehousing and inventory
- **Avoid mismatching of demand and inventory**
- **Print-on-demand (POD) and worldwide**
- **Total cycle time reduction**: from 20 days to 2 or 3 days
- **Customization** – opportunities for tailored marketing and better sales
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R.R. Donnelley & Sons: The Digital Division

• The Digital Vision ... A New Business Model
  • Needs to develop and control **four database systems**
    (Information Technology)
    • A **transaction management system** for triggering and managing the purchasing process
    • A system for royalty **accounting and payment**
    • An **object-oriented database** for managing the intellectual property
    • A **manufacturing database** for directing the digital printing presses

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R.R. Donnelley & Sons: The Digital Division

• The Digital Vision ... **Economic and Technical Validation**
  • Selling his vision within the firm (top management) between 1991-1993
  • **Established a “Venture Capital Fund”** to invest in new print-related technologies
  • Ask corporate Technology Center to **research the capabilities and costs** of new imaging technologies
  • Assigned a small **group of technologist** to the task
  • Determine Donnelley’s **potential competitive advantages** in a “**digital future**”
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R.R. Donnelley & Sons: The Digital Division

The Digital Vision ... Economic and Technical Validation

- Technology suppliers: Xeikon
- Build prototypes
- Conduct over 200 beta tests using data files solicited from Donnelley customers
  - Estimates of throughputs
  - Machine ability
  - Readiness of the technology for the full-scale manufacturing
- Production Costs were higher than expected
  - The presses were expensive
  - Required skilled and dedicated operators
  - Used more toner than anticipated
  - For run lengths of 2,000 or less, digital’s per-unit cost were lower than the costs of offset printing

Competitive Advantages

- Scale Advantage existed in digital technology?
  - Based on investments in Information Architecture and Databases
  - Rather than the manufacturing process itself
- Ability to negotiate volume discounts
- Efficiencies in using sophisticated production control system and multiple presses
- Could make money $$$ on digital printing

Find a home for “digital printing” within Donnelley, or at least to spark a major “digital program”
Reengineering the Technology Development Process
(Jan. to April 1994)

James Turner, Senior VP for Technology, and Head of Technology Center, was assigned the task of “Improving the Technology Development Process.”

The Existing Process
- All the technology development processes were ad hoc
- No projects funding policy, no formal reviews
- Division and marketing managers played a minor role in guiding technology development
- No limits on spending, no deliverables
- No one technology or IT system worked across the company or across groups in a sector

The Redesigned Process

The Redesigned Process

Guided by the Objectives
- Greater speed
- Improved financial data and check points
- Better connections with the division

Exhibit 3 Technology Development Process (diagram)
Exhibit 4 Deliverables for Phase Reviews
Exhibit 3 Technology Development Process

Exhibit 4 Deliverables for Phase Reviews

Phase Review Requirement

- Initiation
  - SWOT analysis
  - Market analysis
  - Financial factors

- Conceptual phase
  - Development timeline
  - Intellectual framework

- Technology development
  - Development of key technology
  - Material selection

- Commercialization
  - Commercialization strategy
  - Marketing plan

- Implementation
  - Implementation plan
  - Technical feasibility

- Validation
  - Validation of key technology

- Business case
  - Business case development
  - Market analysis

- Process
  - Process development
  - Process optimization

*Up to 1/100,000 can be spent without completing Phase I requirements
*Savings = Scientific and engineering costs

Source: R. D. Dorey
Exhibit 4 Deliverables for Phase Review

**Phase I (Program Initiation)**
- SWAG (scientific wild-assed guess)
  - Financial benefits
  - Cost of development/deployment
  - Capital requirements
  - Revenue stream
  - Cost saving
- Schedule of development/deployment
- Make vs. buy
- Skilled set of people
- Initial market assessment
- Set maximum $ that can be spent prior to next justification
- Approval by sector president/sr. VP Technology

**Phase II (Proof of Concept)**
- Rigorous financial review
- Detailed
  - Development schedule
  - Deployment schedule
  - Cost of development/deployment
  - Capital requirements
  - Cost saving
  - Ongoing cost estimates
  - Revenue stream
  - Marketing plan
  - Implementation plan
- Completed program audit
- Determine capital commitment, lead time to meet deployment schedule
- Set maximum $ that can be spent prior to next justification
- Approval by sector presidents/sr. VP Technology
Exhibit 4 Deliverables for Phase Review

- **Phase III (Deployment Commitment)**
  - Final financial
    - Financial justification
    - Deployment schedule
    - Capital requirements
    - Market assessment
  - Completed second program audit
  - Approval by sector president/sr. VP Technology
  - OK to deploy

- **Phase IV (Post Mortem)**
  - Metrics
  - Actual vs. planned
    - Costs
    - Schedules
  - Function vs. release
  - Field performance
  - Installation problems
  - Lesson learned
  - Roles and responsibility problems
  - Process problems
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From Vision to Reality

- The Digital Project (April 1994)
  - Tie into the newly revised "Technology Development Process"
  - Named Barb Schetter “Program Manager” with the objective of creating a new “Digital Color Printing business”
  - The project’s cross-functional team:
    - Marketing: Schneider
    - Manufacturing: Lew Waltman
    - Development: Miller
  - Phase III Review period
    - Barb Schetter, named VP and General Manager of the Digital Division, July 1, 1994
    - Move the Digital Division to The Information Service Group

From Vision to Reality

- The Information Services Group
  - Bart Faber, President of ISG
  - The Digital Division’s new home
    - To look at new technologies that may impact Donnelley’s core business and new ways that Donnelley customers will distribute information
    - Creating a “Scalable Digital Architecture,” for the company in which a single database drove outputs to diverse media
    - From the same image database, be able to
      - Print at any scale
      - Use any print technology, or
      - Deliver the image in any other form the customer wants: CD-ROM, Fax, or Online
    - The entire process, including the formatting for a particular medium, will be automated.
From Vision to Reality

- The Information Services Group
  - Bart Faber, President of ISG
  - ISG Sales Force
    - 60-member sales force, which sold about 85 percent of its volume outside the group’s divisions
    - Targeted industries (non-publishing): financial services, pharmaceuticals and healthcare
    - Tend to bundle together Donnelley products and to include Database Services in the package

Building the Division

- Operations and Technology
  - The first Digital Facility – Memphis, Tennessee
  - Virtually Distributed Manufacturing
  - Close to the central processing and distribution point of Federal Express

- Lew Waltmans – Manufacturing Director
  - Working with a 3rd party vendor
  - Build “the Transaction System and Database to hold customer’s content”
  - By Mid 1995, the system could accommodate Macintoshes and PC-based machines
  - Developed three software tools for customer to remotely manipulate and vary the content in Memphis’s database: Target-IT, Send-IT, and Order-IT
Building the Division

- The Division’s Purpose
  - Attempt to take three distinctive value creation devices
    - A content management system
    - A transaction management system
    - The digital imaging technology
  - Combine them to create a new product
Building the Division

- Marketing and Sales Strategy
  - Target Markets
  - Consultative Selling
    - Sales, DD Print representatives and Product managers
    - Lead customer, lead by customers?
    - ......
  - Mobilizing Sales
    - By June 1995, the Memphis facility was up and running
    - But expected sales had not yet materialized, and the Digital Division was under intense financial pressure. Faber wanted to see the profits by 4Q and a breakeven year in 1996
    - Faber: … new business, special incentives for sales reps, insufficient product knowledge training

Challenges of Internal Acceptance

- By June 1995, the Memphis facility was up and running
  - But expected sales had not yet materialized, and the Digital Division was under intense financial pressure. Faber wanted to see the profits by 4Q and a breakeven year in 1996
  - Faber: …
    - new business, special incentives for sales reps, insufficient product knowledge training
    - Unprofitable, long-term plan?
    - Not in favor of expanding the Digital Division, or Building other Print-on-Demand sites until Memphis was working well
Challenges of Internal Acceptance

- **Schetter:** …
  - Believed that the DD represented an entirely new model
  - **Have large databases** that integrate the software of multiple OSs at multiple geographic locations.
  - **DD success depends** on developing these new skill sets which are hard to find
  - **Biggest concern:** missing company’s strategic initiative on this new technology and business model; “Short-run, on-demand, color printing and the associated delivery system are a strategic initiative.”

- **Book Group:** …
  - Had a single digital press that had received few resources
  - Within 60 days, the Book group would decide
    - 1) Invest in digital printing on a larger scale
    - 2) Move its growing digital business to the Digital Division

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Conclusion