Cost of Complexity Project

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Team Introduction

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Executive Summary

- Built a Cost of Complexity Calculator focused on Netgear's Router product line
- Based on the model from the MIT Research Paper: *Complexity Cost Analysis in a Large Product Line*
- Evaluated Development, Marketing and Warranty Costs for our calculations

Problem Background

- Given Netgear's large product portfolio, we set out to capture the costs of complexity as a guide for Netgear to strategically manage the portfolio
- We constructed a Cost of Complexity (CoC) calculator for evaluating the real profitability of a new product introduction and comparing the true costs of similar products

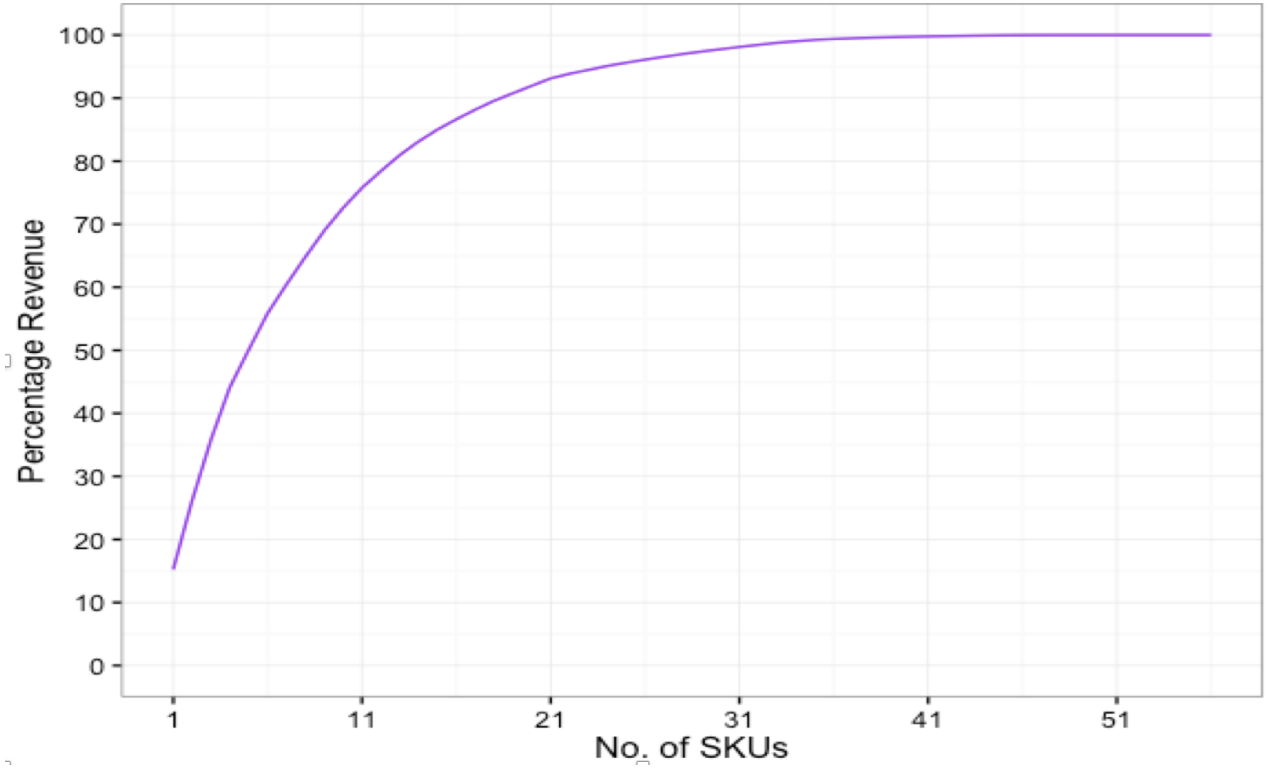
Research

MIT Research Paper*: Complexity Cost Analysis in a Large Product Line* by José Luis Landívar Chavez (May 2006)

- The objective of a Cost of Complexity Calculator is to get the expected complexity-adjusted costs of introducing a new product
- Different product line profiles have different complexity cost drivers (i.e. inventory driven costs vs. organizational inefficiencies or R&D complexities)

Initial Analysis

- To get an idea of the level of complexity in the current production line one can look at the percentage of revenue covered by a given number of SKUs



Costs during Product Life Cycle

Development Costs
- Prototyping
- Qualification
- Testing

Sales and Marketing Costs
- "Contra payments" to support sales programs and deplete excess channel inventory

Material Costs
- Missed opportunities for volume discounts as volume is spread across parts
- Inefficient manufacturing and administrative overhead
- Quality issues and rework costs

Parts Inventory Cost
- Cost of keeping excess inventory in the supply chain as well as holding and stock-out costs to support unnecessary complexity

Warranty Costs
- Cost of supporting warranty program, including spare parts, etc

Organizational Costs
- Impact on business performance from stretched resources

Determining CoC for New Product

1. • Collect all results for all cost areas
2. • Aggregate complexity cost of a product
3. • Estimate the cost of complexity for a product similar to the one intended for introduction

Cost of Complexity Analysis

SKUs selected for analysis

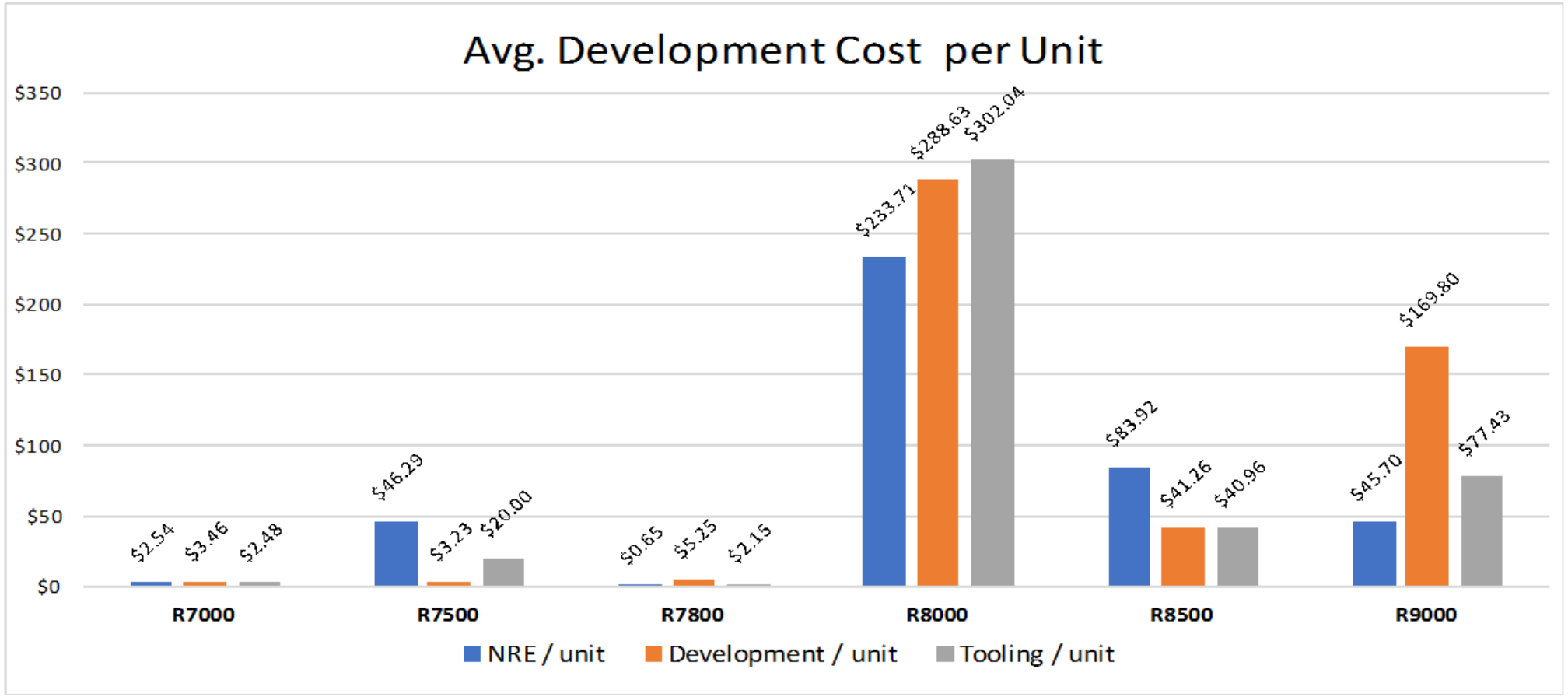
SKUs from Router Families R7000, R7500, R7800, R8000, R8500 and R9000 sold in the Last 2Q's of 2017.

1. Included new products (sold for less than 1 year) because the majority of data we have is of these products
2. Excluded all EOLs based on the data provided to us
3. Excluded products only sold in 2016 and not 2017
4. Excluded products that have small negative quantities and/or revenues

R7000	R7500	R7800	R8000	R8500	R9000
R6700-100NAR	R7500-100NAS	R7800-100INS	R7900-100NAR	R8500-100INS	R8900-100NAS
R6900-100THR	R7500-100PRS	R7800-100JPS	R7900-100NAS	R8500-100JPS	R9000-100AUS
R7000-100AUS	R7500-200NAR	R7800-100NAR	R8000-100INS	R8500-100KOS	R9000-100EUS
R7000-100CNS		R7800-100NAS	R8000-100JPS	R8500-100PRS	R9000-100JPS
R7000-100JPS		R7800-100PES	R8000-100KOS	R8500-100UKS	R9000-100NAS
R7000-100KOS		R7800-100PRS	R8000-100NAR		R9000-100PRS
R7000-100NAR		R7800-100UKS	R8000-100NAS		
R7000-100NAS		R7800NE-100PES	R8000-100PAS		
R7000-100PAS			R8000-100PES		
R7000-100PES			R8000-100UKS		
R7000-100UKS			R7900P-100NAS		
R7000CC-100NAS			R8000P-100CNS		
R6900P-100NAS			R8000P-100EUS		
R7000P-100AUS			R8000P-100INS		
R7000P-100CNS			R8000P-100JPS		
R7000P-100NAS			R8000P-100NAS		
R7000P-100PES			R8000P-100PRS		
R7000P-100PRS					
R7000P-100UKS					

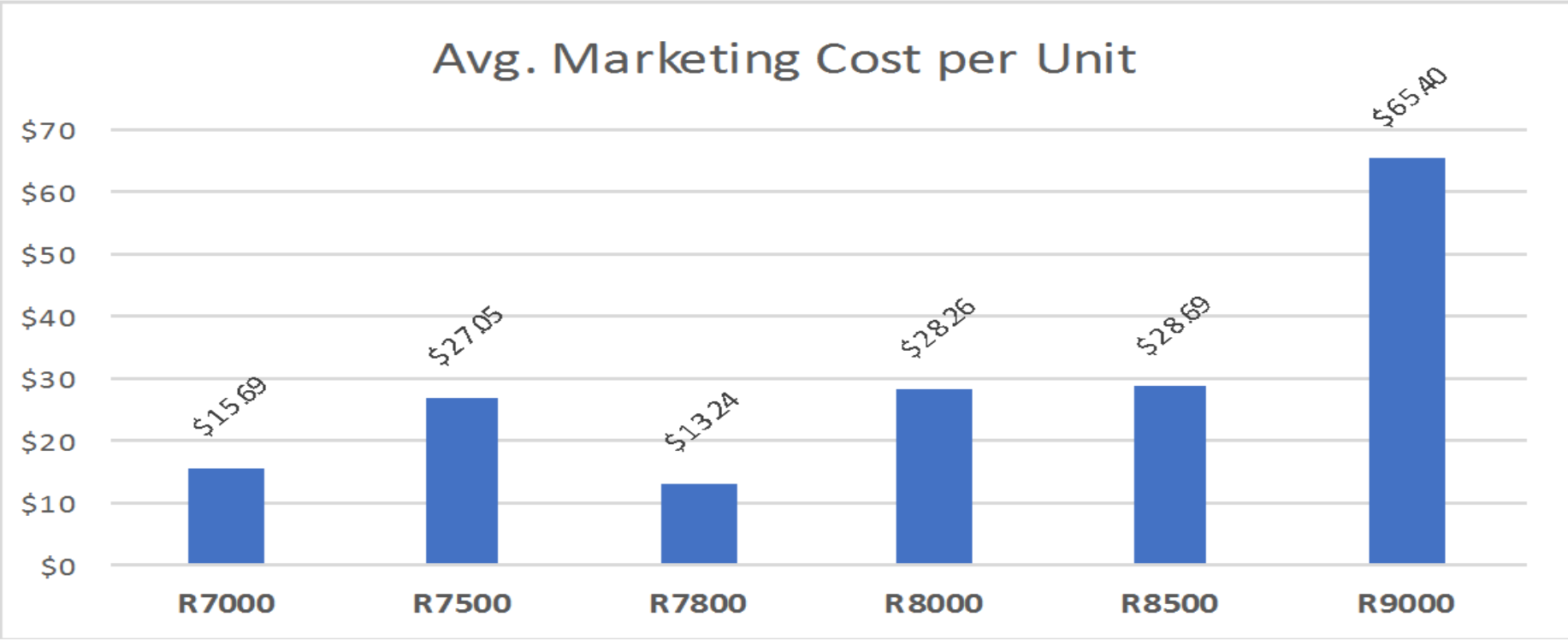
58 SKUs Total

Development and R&D Costs



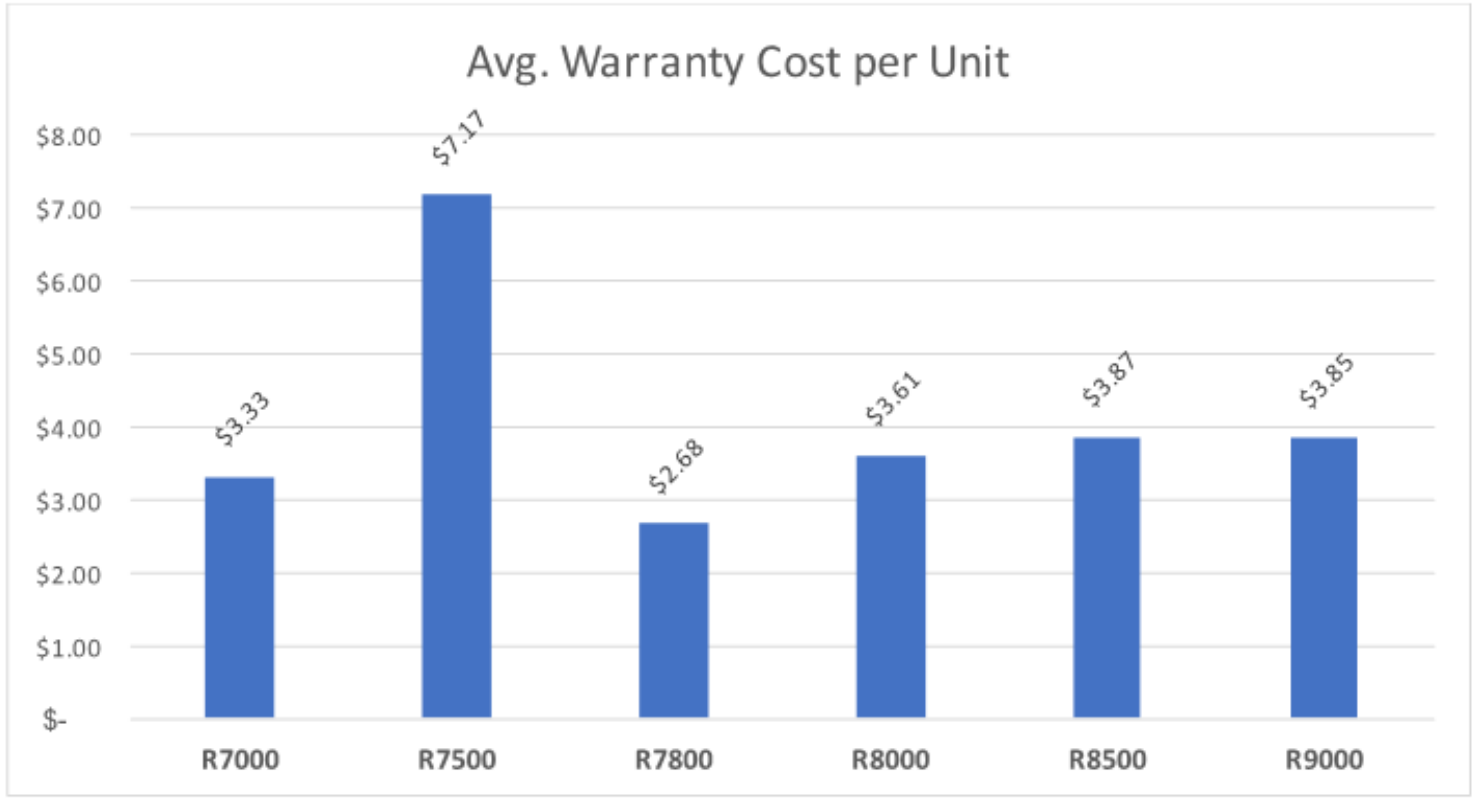
- The driver of cost for each product family varies across the 6 families
- SKUs with lower volume of sales had higher per unit costs

Marketing Costs



- Marketing cost does not vary significantly across product families, except for R9000 family

Warranty/Support Costs



- Costs are generally similar across product families, except for R7500

Cost of Complexity Calculator Demo

		Estimated Annual Unit Volume	Cost per Unit NRE	Development	Tooling	Marketing	Warranty
Product Family:	R8000	100,000	$ 46.48	$ 57.40	$ 60.07	$ 26.70	$ 3.51
SKU:	R8000-100UKS	50,000	$ 1.86	$ 2.30	$ 2.40	$ 21.93	$ 4.49

Total Cost NRE	Development	Tooling	Marketing	Warranty	Grand Total Cost
$ 4,648,142.48	$ 5,740,328.96	$ 6,007,025.66	$ 2,669,908.11	$ 350,848.12	**$ 19,416,253.34**
$ 93,007.65	$ 114,861.91	$ 120,198.42	$ 1,096,353.77	$ 224,634.80	**$ 1,649,056.54**

Q&A