

PRODUCT DESIGN

# MAKE VS. BUY

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## INTRODUCTION

# Making the Right Decision

Your marketing and sales teams have dropped specifications for a new product on your desk. It's your job to turn this into a viable product. If you miss your deadlines or are unable to produce a high-quality product, you could lose your job and the company could suffer significant consequences, such as:

- ✘ Project Launch Delays
- ✘ Lost Revenue and Profits
- ✘ Increased Engineering Costs
- ✘ Negative Customer Feedback
- ✘ Poor Quality
- ✘ Repair Costs
- ✘ Product Revisions
- ✘ Failures

THE FIRST QUESTION FOR THE ENGINEER IS

## Do I make it or buy it?

### Hardware

#### DESIGN

The hardware design for embedded projects has many complex elements, including:

- The i.MX processor has 8-10 layers and many high-speed signals, including over 500 pads on the processor alone
- High-speed DDR4/LPDDR4, including memory tuning and calibration
- Complex power architectures that have power sequencing

Assuming expert-level engineers, our analysis shows a typical project takes about 1 year. Let's target a **\$150,000** cost in internal engineering costs for the first-pass design effort.

### Software

#### BRING-UP & MAINTENANCE

From initial bring-up, there are many software tasks required to get a board working. Board bring-up and validation on average takes 160 engineering hours. Annual board maintenance including security updates, OS optimizations, kernel optimizations, U-Boot updates and general support or the hardware aspect takes an average of 200 hours per year.

Third-party software companies typically charge \$100-\$200/hr for software support and maintenance. In year one, **software costs are in excess of \$50,000 with annual maintenance of \$20k-\$40k per year.**

# Manufacturing

Now let's compare the cost of using a System-on-Module versus an in-house design from a manufacturing-cost perspective. We surveyed six contract manufacturers around the US to quote our NIT6Q\_SOM full turnkey quote and then we compared to our advertised pricing.

LOCATION	COST (PER UNIT, QTY 5000)
Alabama	\$164.25
N. California	\$152.50
N. California	\$140.13
New York	\$168.72
Texas	\$130.69
Pennsylvania	\$110.46
<b>Average Cost</b>	<b>\$144.46</b>
<b>Our Resale</b>	<b>\$92</b>
<b>SAVINGS</b>	<b>\$52.46</b>

With over a 5000-piece order, this equates to a total savings of:

**\$262,300**

## ADDITIONAL CONSIDERATIONS

### But there's more...

- Boundary Devices manages End-of-Life notices on the product (both supply chain and software)
- Boundary Devices 100% tests and validates all boards and handles all RMA requests within warranty period
- 3-6 months faster time to market
- Higher-quality product
- Includes on-going software support

## Make vs. Buy Summary

MAKE (IN-HOUSE)		BUY (BOUNDARY DEVICES)		
Consideration	Cost	Consideration	Cost	Savings
Design	\$150,000	Design/Testing/Software	\$0	<b>\$150,000</b>
Manufacturing (Qty 5000)	\$722,300	Manufacturing (Qty 5000)	\$460,000	<b>\$262,300</b>
Software Bring-Up	\$50,000+		<b>\$0 - Included</b>	<b>\$50,000+</b>
Ongoing Software Support/Maintenance	\$20,000 - \$40,000/yr		<b>\$0 - Included</b>	<b>\$20,000-\$40,000/yr</b>
Time to Market	12-18 months	Time to Market	3-6 Months	<b>9-12 months</b>



## COMPANY INFORMATION

### **About Boundary Devices**

Boundary Devices is a leading global supplier of ARM-based Single Board Computers and System on Modules for the general embedded market. Founded in 2003, our corporate headquarters is located in Lake Forest, CA.

We specialize in creating custom solutions tailored to the exact specifications of the customer. By using the core layout of existing development systems, we can produce custom designs on time and on budget.

Boundary Devices is an NXP Proven Partner that has completed countless successful projects with the NXP i.MX family of processors. Because we design only i.MX based boards, we are the industry leader in i.MX custom designs. All of our products are designed, tested and manufactured in the US.



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