

WELCOME TO

# Advanced Manufacturing Minneapolis



October 10–11, 2023

Minneapolis, MN  
Minneapolis Convention Center



# The Failure of QFD

Perry K. Parendo, Perry's Solutions, LLC



Perry@PerrysSolutions.com | www.PerrysSolutions.com | @PerrysSolutions

New Product Development –  
Automotive, Aerospace, Defense, Medical Device

# Agenda

MD&M  
MINNEAPOLIS

MinnPack

ATX  
MINNEAPOLIS

D&M  
MINNEAPOLIS

Plastec  
MINNEAPOLIS

- **Story of The First Failure**

- Magazine story

- **Fuzzy Front End**

- **House of Quality**

- **Full QFD**

- **Getting to Success**

# Fuzzy Front End



- The first step in New Product Development has a common experience – sometimes this is called the “Fuzzy Front End”
- Many teams just want to get to the “real work”
- The problem – the Fuzzy Front End has a large impact on project success, yet it is either avoided or not done well in many cases.

# Components of Fuzzy Front End



- Customer needs – QFD helps here, focus of this discussion
- Requirements
- Project Planning
- Risk Management
- Team selection and organization
- Technology advancement

# QFD Benefits Experienced



- **Patent**

- Technical breakthrough insight

- **Customer needs**

- Communicate alternatives in complex situation

- **Advanced hardware technology**

- Key parameters and components

- **Automation**

- Concept evaluation, evolution and selection

- **Development testing needs**

- Avoid new product launch customer complaints

# House of Quality



- **What is it**

- A method to consider (assess) design features and the associated requirements
- Often the limit of QFD usage, thus what most assume QFD is

- **Why use it**

- Prioritization
- New product, not well understood or established use

- **When not to use it**

- Well established product

- **Weaknesses**

- Manipulation of the numbers
- Time consuming

# House of Quality Graphic

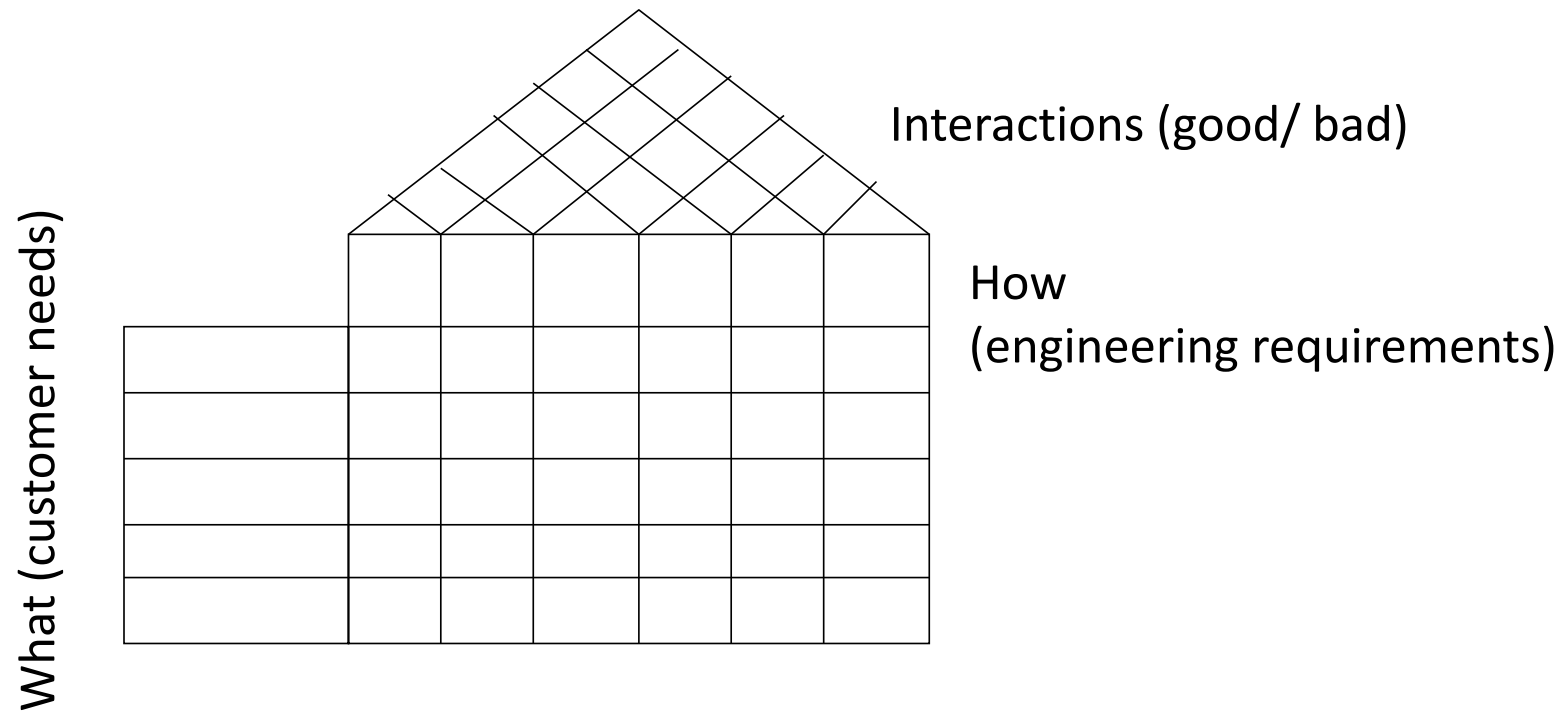
MD&M  
MINNEAPOLIS

MinnPack

ATX  
MINNEAPOLIS

D&M  
MINNEAPOLIS

Plastec  
MINNEAPOLIS





# HOQ/ QFD Example



	Importance		A - relation	A - score	B - relation	B - score	C - relation	C - score
Req. 1	5		9	<b>45</b>	3	<b>15</b>	3	<b>15</b>
Req. 2	1		1	<b>1</b>	1	<b>1</b>	3	<b>3</b>
Req. 3	2		3	<b>6</b>	0	<b>0</b>	3	<b>6</b>
Total Score	x		x	<b>52</b>	x	<b>16</b>	x	<b>24</b>

# 4 Chart Version (Clausing)

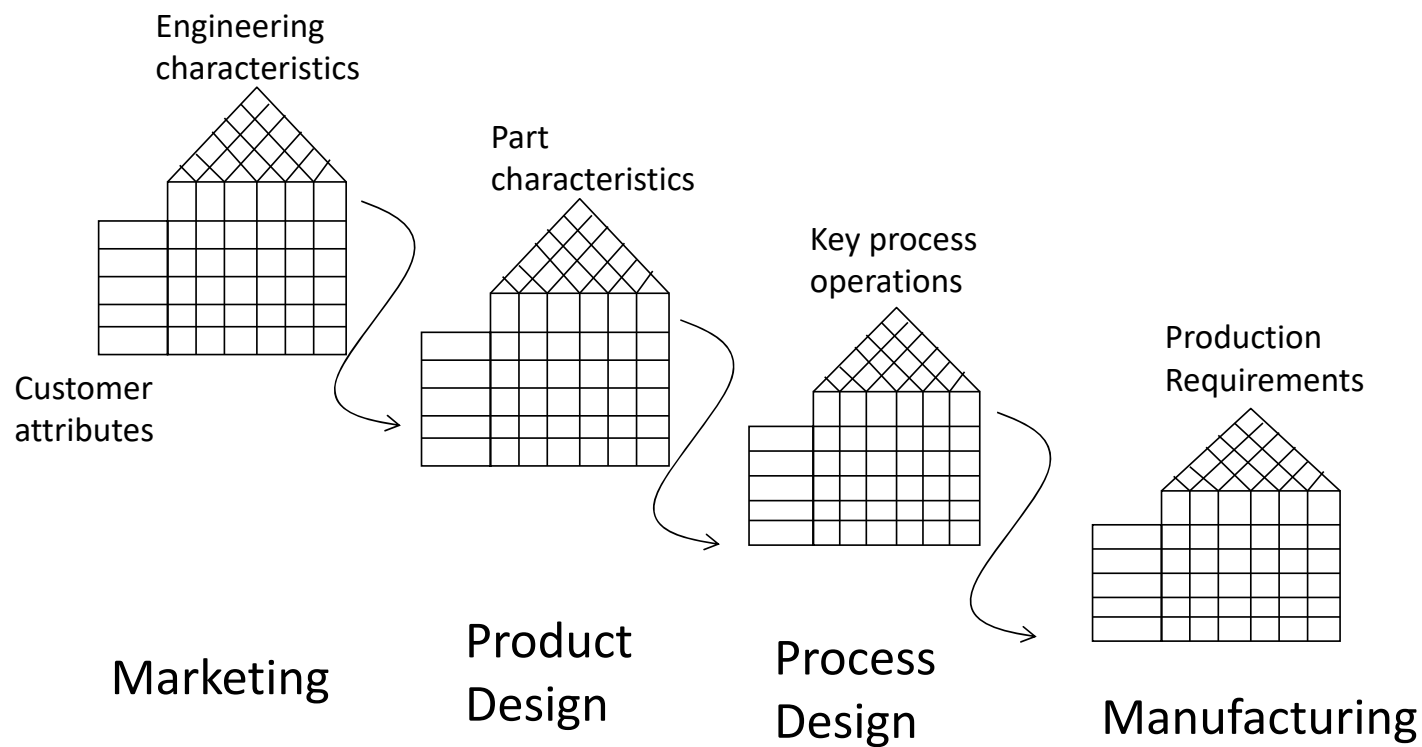
MD&M  
MINNEAPOLIS

MinnPack

ATX  
MINNEAPOLIS

D&M  
MINNEAPOLIS

Plastec  
MINNEAPOLIS

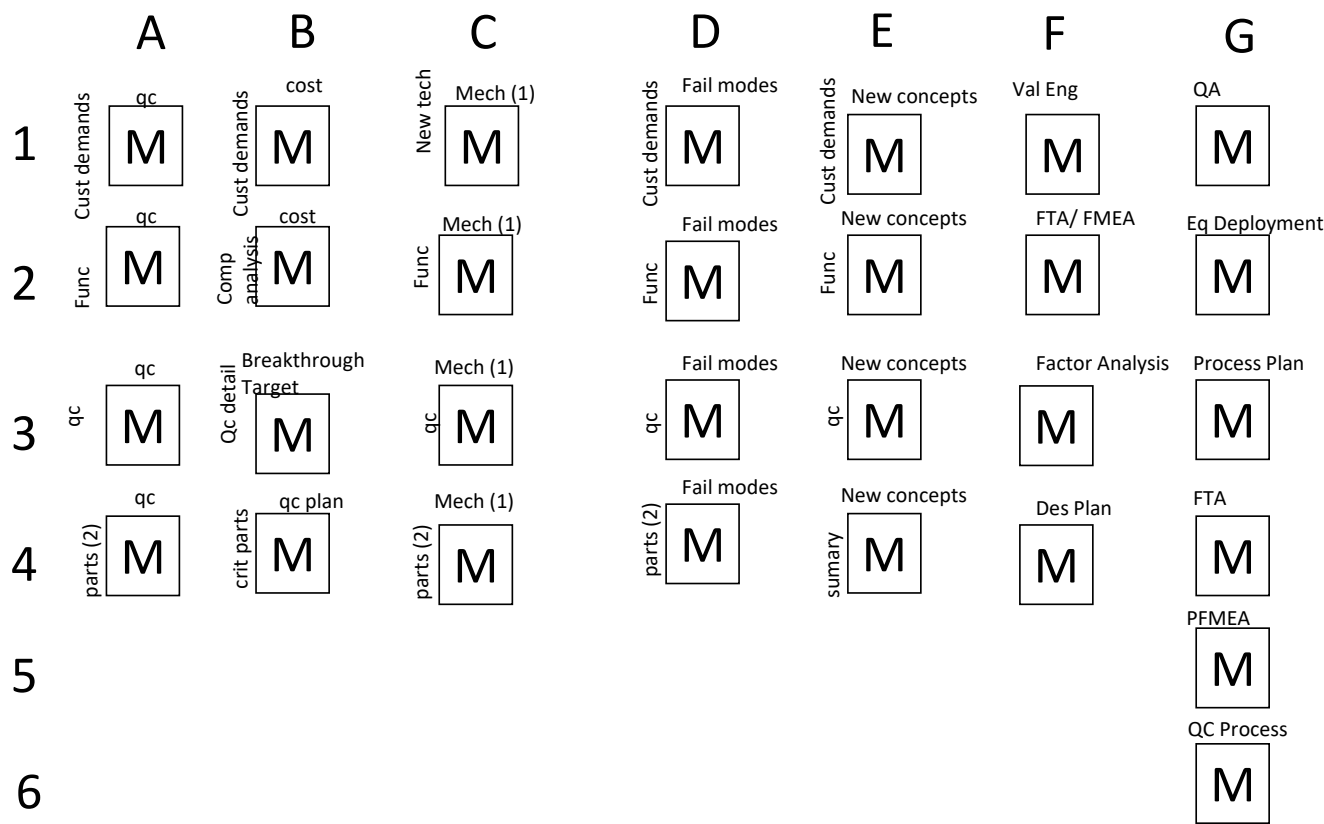
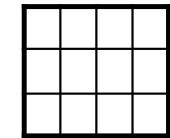


# Full QFD System



- **What is it**
  - Multi chart system for QFD, 30+ tools
- **Why use it**
  - Many different purposes (more on this later)
  - To gain flash of genius, break through thinking
- **When not to use it**
  - Be careful in tense situations
- **Weaknesses**
  - Overwhelming because of the many options

# Full QFD System



# Pugh Example (like E1)



	A	B	C	D	E	F	G	H
Requirement 1	+	+	+	0	+	+	+	0
Requirement 2	-	+	0	+	-	+	-	+
Requirement 3	+	0	+	+	0	-	+	+
Requirement 4	+	-	0	+	-	+	+	-
Requirement 5	+	+	-	+	+	+	+	+
Total +'s	4	3	2	4	2	4	4	3
Total -'s	1	1	1	0	2	1	1	1

Now what???

# Full QFD System Segments



- Analyze Customer Demands
- Critique functions
- Set quality characteristics
- Identify critical parts
- Set breakthrough targets
- Set cost targets
- Set reliability targets
- Select new concepts
- Identify breakthrough methods
- Identify manufacturing methods

# Method Comparison



	Japan - Original - FULL	US - HOQ
Creation	Japan, King	Clausing, ISO
Started	1966/ 1989	1994/ 2015
Focus	Broad	Narrow
Application	Various	Automotive
Framework	Benefits	Tool
Struggle	Overwhelming	Bureaucratic

Failure resolved by selective use  
and focusing on benefits.

# House of Quality Example



Sheet1

attribute	imp	CARD	statgraphic demo	NCSS	JMP demo	Wisdom demo	Minitab demo	Stat-ease in-house
diagnostics	5	3	9	9	3	1	9	9
center pnt	5	3	9	0	9	9	9	9
transform	4	0	0	0	0	0	0	9
botched da	3	1	0	0	0	0	0	9
foldover	3	9	9	0	0	3	0	9
custom ran	2	0	0	1	1	0	1	9
RSM capat	5	9	9	9	9	9	9	9
3-levels BE	3	0	9	9	9	9	9	9
windows	2	9	9	9	9	9	9	9
mixtures	3	9	9	0	9	0	9	9
graphics in	5	0	3	0	9	0	1	3
		150	249	137	224	149	214	330
		nominal	GOOD	bad	GOOD	nominal	GOOD	BEST
			\$1,050				\$900	\$1,000
			partial system		for power users		UST standard	some basic stats

Calculation is embedded



# Getting to Success



- Focus on the benefits you want to obtain
- Use only tools when and where needed
- Use in situations without conflict, drama or major politics

# Focused Training Segments



- **Technical Breakthrough**
- **Cost Reduction/ Avoidance**
- **Fuzzy Front End/ Definition**

# Component References



- Customer needs (identification and prioritization)
- Requirements (ASQ)
  - <https://perryssolutions.com/dev/publications/Requirements%20in%20Innovative%20Environments%20-%20PDS%202013%20-%20Perrys%20Solutions.pdf>
- Project Planning (PDMA and MDM)
  - <https://perryssolutions.com/dev/publications/Best%20Practices%20for%20Robust%20Design%20-%20PDMA%202019%20-%20Perrys%20Solutions.pdf>
  - <https://perryssolutions.com/dev/publications/Project%20Management%20Best%20Practices%20-%20Perrys%20Solutions%20-%202019.pdf>
- Risk Management (MDM and ASQ)
  - <https://perryssolutions.com/dev/publications/Risk%20Management%20For%20Project%20Execution%20-%20MDM%20-%20Perrys%20Solutions.pdf>
  - <https://perryssolutions.com/dev/publications/Is%20Risk%20Management%20Valuable%20for%20me%20-%20Perrys%20Solutions.pdf>
- Team selection and organization (ASQ)
  - <https://perryssolutions.com/dev/publications/ASQ%202021%20-%20Design%20Culture%20-%20Perrys%20Solutions.pdf>
- Technology advancement (MDM)
  - <https://perryssolutions.com/dev/publications/Introducing%20Technology%20with%20Reduced%20Risk%20-%20MDM%202022%20-%20Perrys%20Solutions.pdf>



# Thank you!

—

## QUESTIONS?

**Perry K. Parendo**

*President, Perry's Solutions, LLC*

Perry@PerrysSolutions.com | [www.PerrysSolutions.com](http://www.PerrysSolutions.com)