

Improve

Now we embark on the path of developing a solution. Our goal is to generate, evaluate and select a root cause solution to get the right and effective permanent process improvement. The benefit of applying a disciplined, fact-based problem solving methodology is that the solution often ‘leaps out’ at the team.

Generate Improvement Ideas

We chose to have brainstorming sessions to generate creative thoughts to be merged and expanded upon. We pulled together the team of Sales Managers, Executive Team members and Six Sigma Project Manager to generate as many analytical and creative ideas as possible, with no constraints and no criticism (no ‘idea assassins’). The Six Sigma Project Manager facilitated the two 1 hour time limited sessions to keep focus on the root cause, ensure ground rule adherence and keep the meeting progressing.

On the next page, brainstormed ideas are presented, already categorized in Affinity groups.

Improve effectiveness of current design selection process

- 1 Provide open access to design selection room to Buyers.
- 2 Offer access to design selection room to Buyers at time of contract meeting close with Sales presence.
- 4 Coordinate design selection room visits by next business day after contract
- 5 Provide key code to Buyers to enter design selection room without Sales presence.
- 6 Institute a program to put a heavy premium cost to change orders after the build-out phase begins
- 7 Establish a 'no start' rule for build-out if sign-offs not complete
- 8 Put the design selection room in corporate offices to mitigate need for Sales presence.
- 9 Duplicate design selection room in corporate offices.
- 10 Executive Team review and assessment design selection progress for each case.
- 12 Compress design selection process with more frequent meetings
- 14 Determine and document late selection impacts to build-out unit cost and schedule
- 15 Project late selection consequences to Buyer (schedule, fees)
- 28 Have construction manager partner with Sales to verify body of sign-offs before build-out start
- 29 Penalize Buyer for sign-offs that become post build-out phase change orders
- 30 Build lessons learned dBase for design selections, actions required and improvement needs
- 31 Reward Sales for units without change orders
- 32 Reward Buyer (rebate) to be awarded after closing for units without change orders

Improve design selection material provided to Buyers

- 11 Mock-up models of kitchens, bathrooms and fireplaces with inter-changeable options
- 13 Provide design selection hand-outs per Buyer request
- 16 Create portfolio of selection data for easy pull-up on CPU during design selection meetings
- 17 Create 'what if' programs to diagram options on CPU for use during design selection meetings
- 19 Modify programs used by the kitchen & bath vendor mock-up programs for Hummel use
- 20 Research software package availability to build mock-up programs
- 25 Provide design selection materials for key selection areas of kitchen, bath & fireplace
- 26 Form marketing committee to determine design selection material content
- 27 Survey past Buyers to determine acceptability and effectiveness of enhanced materials
- 33 Form 'dream' packet providing Buyers with key design selection materials for each development

Improve design selection material delivery method & process

- 3 Provide design selection sign-off sheets to Buyer to set expectations and provide a guide for preparation.
- 18 Provide 'what if' user programs to Buyer for home use on their CPU
- 21 Provide work station(s) to non-technical savvy Buyers for in-house design selection 'what ifs'
- 22 Build in-house design selection kiosk with needed materials and workstation for Buyer off-line use
- 23 Locate kiosk in design selection room
- 24 Provide design selection materials to Buyer at end of contract meeting

Evaluate and Select Solution

Our objective is to present the 'best' idea to recommend to management. In order to responsibly evaluate these ideas, we have developed a set of evaluation criteria that are

objectively and uniformly applied. First we run brainstormed ideas through 'show stopper' and then 'organizational fit' filters.

Before we get started, we want to pull out ideas that are earmarked for a future project to create a paperless process. The marketing initiative is called ‘painless’ home-buying. A ‘virtual’ paperless design selection process is part of that initiative. Following are those ideas grouped.

Future consideration for longer term 'vital' design selection solution:	
16	Create portfolio of selection data for easy pull-up on CPU during design selection meetings
17	Create 'what if' programs to diagram options on CPU for use during design selection meetings
18	Provide 'what if' user programs to Buyer for home use on their CPU
19	Modify programs used by the kitchen & bath vendor mock-up programs for Hummel use
20	Research software package availability to build mock-up programs
21	Provide work station(s) to non-technical savvy Buyers for in-house design selection 'what ifs'
22	Build in-house design selection kiosk with needed materials and workstation for Buyer off-line use
23	Locate kiosk in design selection room

Show Stopper Filter

These are solutions, for example, reasons of adverse effect on customers or not meeting Charter requirements, should be removed prior to performing additional analysis.

	Brainstorm	Filter reason
28	Have construction manager partner with Sales to verify body of sign-offs before build-out start	Beyond organizational scope of charter
11	Mock-up models of kitchens, bathrooms and fireplaces with inter-changeable options	Extends beyond 1 month implementation period
9	Duplicate design selection room in corporate offices.	Over \$ 50mm capital expenditure
29	Penalize Buyer for sign-offs that become post build-out phase change orders	Address a defect, but create adverse consequences to the Buyer
1	Provide open access to design selection room to Buyers.	Violate organizational policy
5	Provide key code to Buyers to enter design selection room without Sales presence.	Violate organizational policy

Organizational Fit Filter

The solutions that remain are capable of being implemented and may achieve desired goals. However, that does not necessarily mean that it is appropriate or achievable in the organization. Following are ideas that are filtered out and why (e.g. management commitment, strategic factors, operating systems, organizational culture, etc.).

	Brainstorm	Filter reason
32	Reward Buyer (rebate) to be awarded after closing for units without change orders	Management support is not expected
8	Put the design selection room in corporate offices to mitigate need for Sales presence.	Management support is not expected



31	Reward Sales for units without change orders	Ideas conflict with 'reward systems'
6	Institute a program to put a heavy premium cost to change orders after the build-out phase begins	Ideas do not align with strategic focus of enhancing Buyer experience
7	Establish a 'no start' rule for build-out if sign-offs not complete	Ideas do not align with strategic focus of enhancing Buyer experience
12	Compress design selection process with more frequent meetings	Ideas do not align with strategic focus of enhancing Buyer experience
15	Project late selection consequences to Buyer (schedule, fees)	Ideas do not align with strategic focus of enhancing Buyer experience

Solution Impact Filter

Before evaluating remaining solutions, we group them into independent and coupled solution categories. Independent solutions are capable of satisfying project goals alone or are unique and cannot be combined with others. Solutions are coupled if they are not capable of meeting project goals alone, but are when combined with others.

Independent Solutions

- 10 Executive Team review and assessment design selection progress for each case.
- 14 Determine and document late selection impacts to build-out unit cost and schedule
- 30 Build lessons learned dBase for design selections, actions required and improvement needs
- 3 Provide design selection sign-off sheets to Buyer to set expectations & provide a guide for preparation.

Coupled Solutions

A. Design selection Buyer-Sales vigilance	
2	Offer access to design selection room to Buyers at time of contract meeting close with Sales presence.
4	Coordinate design selection room visits by next business day after contract
13	Provide design selection hand-outs per Buyer request

B. Design selection 'dream' packet	
24	Provide design selection materials to Buyer at end of contract meeting
25	Provide design selection materials for key selection areas of kitchen, bath & fireplace
26	Form marketing committee to determine design selection material content
33	Form 'dream' packet providing Buyers with key design selection materials for each development
27	Survey past Buyers to determine acceptability and effectiveness of enhanced materials

Assumptions to base objective and realistic assessments are assembled by experienced subject matter experts.

- 1 *Attaining 3.0 Sigma for design selection sign-off by end of 2nd meeting will reduce extension of Sale to Closing interval to infrequent (rare common cause variation - random, inherent to system)*
- 2 *Solution implementation will not eliminate special cause variation (unpredictable, intermittent events) resulting in occasional Sale to Closing interval extensions*
- 3 *Risks are associated with less analytical and intuitive approach to solution selection*
- 4 *Solution implementation time measured in calendar before process is performing - Gantt Chart (longer the solution takes to implement, the greater the risk that goals will not be met)*
- 5 *Solution implementation cost measured in material, person-hours, vendor service & advisor needs*

Six solutions (4 independent, 2 coupled) will be evaluated by both quantitative and qualitative impact criteria. The Criterion Matrix will be used for evaluation. It assures visibility is given to the factors considered important to the organization. Following are the qualitative and quantitative factors used.

- Sigma – quality improvement (% of on-time sign-offs)
- Time – implementation interval to achieve expected performance level
- Cost / Benefit – (setup & implementation + unit cost vs. solution benefits)
- Critical to Quality (CTQ) – (1. better target performance for closing, 2. better customer experience)
- Root Cause – ability to reduce or eliminate root cause of poor performance

Five impacts will be estimated for each solution and weighted in the Criterion Matrix summing to a total point value for each solution. Highest point value will indicate the ‘best’ solution. Following are the performance rankings with its associated weighting for each criterion, predicated on project goals.

Sigma Impact (WT=2)

Design selections

Sigma	Points
>= 3.0	10
2.50 - 2.99	7
2.00 - 2.49	4
<2.0	1

Time Impact (WT=1)

Time-to-Performance interval

Weeks	Points
<2	10
2 - 4	8
5 - 7	6
8 - 10	3
>10	1

Cost/Benefit Impact (WT=2)

Payback period

Years	Points
<.25	10
.25 - .49	8
.50 - .75	6
.76 - 1.0	4
>10	1

Root Cause Impact (WT=3)

Problem mitigation correlation

Ratio	Points
1:1	10
2:1 - 1.1:1	7
3:1 - 2.1:1	4
>3:1	1

CTQ Factor Impact (WT=3)

No. of CTQ's improved

Factors	Points
>=5	10
4	8
3	6
2	4
<2	1

Following are definitions and estimation methods for each criterion.



- **Sigma Impact:** Solutions impact on Sigma value for signing-off categorical design features. Ranking estimated by subject matter experts.
- **Time Impact:** Span of time (calendar, resources) to design and implement the solution. Subject matter experts rank using ‘best case / worst case’ scenarios for designing and implementing by person-days. We recognize the risk of delay can reduce solution benefits and goals not be met.
- **Cost/Benefit Impact:** Payback period to breakeven on the costs of implementing. Costs: materials, admin (order, compile), resources / Benefit: cash flow generated from reducing sale to closing interval (based on 25% per year for value of inventory (cost of money + carrying cost + opportunity cost [e.g. expected return on investment] + other) (e.g. cash flow improvement calculation, 25%/12 mo. x \$500k unit cost (per month per unit).
- **Root Cause Impact:** Solutions ability to reduce root cause problem of design information availability for Buyer use for decision making. Subject matter experts estimate impact levels.
- **Critical-to-Quality (CTQ) Impact:** Solutions ability to impact Buyer’s quality requirements (e.g. reduced Sale to Closing interval, high quality unit feature delivery, minimal Buyer effort through unit delivery process, etc.). Executive Team to provide performance ranking predicated on expert input and ‘having finger on the pulse’ of customer requirements.
- **Other:** Considerations are also given other impacts to solution implementation (e.g. market share increases, market penetration, brand recognition, morale enhancement, customer satisfaction, etc.).

Following are results of the evaluation:

Solution Evaluation Criterion Matrix

Solution	Sigma Impact (2)	Time Impact (1)	Cost / Benefit Impact (2)	Root Cause Impact (3)	CTQ Factor Impact (3)	Total Points	Rank
10	2	8	20	12	3	45	4
14	2	6	2	3	3	16	6
30	2	6	4	21	12	45	4
3	8	10	16	12	18	64	2
A	8	8	2	12	18	48	3
B	20	3	12	30	24	89	1

Coupled solution ‘B’ is determined to be the ‘best’ solution and is re-stated below.

At end of contract meeting, provide the Buyer a design selection (dream) packet providing critical to sign-off information (designs, specifications, pictures, diagrams, etc.) touching on all selection categories, but focusing

on the key problematic selections relating to the kitchen, bathroom(s) and fireplace.

Solution Design

The Six Sigma team met to determine the key attributes of the ‘dream’ packet. Pre-compiled book spines provided for unit/Buyer specific customization. Following are the results:

- Hard cover three-ring binder with window to slip in a marketing pre-printed cover sheet
- Major feature categories delineated by sub-dividers – front section with contents
- Feature instruction sheet in each section in clear page protector
- Work and note sheets provided at front of each section and at back of packet
- Section for process and cut-off date reports
- Pocket dividers for miscellaneous documents to keep all unit related items in one place
- Ample binder width for adding unit/Buyer customized marketing and design selection materials (pictures, specs., options, designs, diagrams, worksheets, etc.) from development Sales office inventory

In this section, we systematically evaluated ideas to select the optimal solution that is aligned with the organization’s strategy and operational plans. Now let’s go on to implementation and sustaining the gains.