

Post Construction Quality Evaluation – A Manufacturer’s Use of the End User to Minimize Risk

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A roofing manufacturer is motivated to increase accountability, minimize risk and differentiate themselves from other manufacturers to increase their sales. In order to achieve this, the manufacturer approached the research group to implement a warranty program that measures the performance information of their systems and applicators. The manufacturer submits a list of warranted jobs to the researchers, researchers perform a satisfaction check by calling the end users and report back to the manufacturer. Concepts utilized by the manufacturer include the use of warranty to ensure performance decreases risk, transparency is the best way to mitigate risk and risk can be mitigated before it happens. The research revealed that warranty program minimizes the risk for manufacturer and clients and helps differentiates the manufacturer by identifying end users that are not satisfied, applicators that are low performing, jobs that are leaking, customer retention rate and having a running log of satisfaction rating for every warranted job.

Keywords: end user, manufacturer, performance information, risk, warranty

Introduction

The last couple of decades have revealed a poor documentation of performance information in the construction industry (Cahill and Puybaraud, 1994; CFMA, 2006; Davis et. al., 2009, Egan, 1998, Flores & Chase, 2005). Due to poor documentation of performance, roofing manufacturers and contractors are unable to differentiate themselves from other competitors and are enticing buyers to purchase their services based on low price and long term warranty durations. The manufacturers and contractors that provide high quality materials have a tough time competing in this price-based market riddled with false promises through the use of warranties (Kashiwagi, 2012). The warranty does not protect the buyer since it is an offer of protection provided by the manufacturer to the buyer (Agrawal *et. al.* 1996). The warranty is written by a roofing manufacturer and its legal representatives that contain certain exclusions, if encountered, will void the warranty (Christozov *et al.*, 2009). Hence, the long term warranties have no proven correlation with the performance and the life cycle of a roofing product (Kashiwagi, 2011).

The subject manufacturer realized that in order to survive in the competitive market saturated with low price and false promises, they need to differentiate themselves from other manufacturers in a dominant way that will minimize the risk of the manufacturer and the client creating a “win-win” environment. The subject manufacturer approached the researchers in March 2011 to solve this issue. The, researchers proposed a Post Occupancy Evaluation (POE) method that tracks the satisfaction rating of the buyers through the use of performance information of all the warranties issued by the manufacturer known as client satisfaction warranty program. The Post Occupancy Evaluation (POE) method, where a finished product is

evaluated to measure the quality for continuous improvement on future products, is currently being implemented in the industry (Wicks and Roethlein, 2009). Buyer satisfaction questionnaires have been distributed after each project to impact future projects positively through corrective behavior modifications (Forbes 2002; Gajjar et. al. 2012).

Methodology

The manufacturer initiates the client satisfaction warranty program by sending a list of all the warranted jobs to the researchers as illustrated in Fig. 1. After receiving the list of jobs, researchers contact the end users for satisfaction ratings and direct feedback regarding the job. The researchers report back the information to the manufacturer with satisfaction ratings, problems and issues identified by the buyer that is compiled into a performance information matrix.

The questionnaires for the warranty process were developed jointly by the researchers and manufacturer. The subject manufacturer showed an immense interest to have the measurement for an end user buyer satisfaction rating for their product, contractors installing the product, their representative present on the job site, leaks on the job site and customer retention rate. The researchers agreed that these are the critical elements for a successful roofing job and this would help the manufacturer to clearly identify the unsatisfied end users and mitigate the problems proactively. Keeping these objectives in focus, the following questions were developed:

1. Satisfaction rating of the roofing system (1 lowest – 10 highest)
2. Would you purchase the manufacturer's product again? (Yes or No)
3. Is the roof currently leaking? (Yes or No)
4. Satisfaction rating of the contractor (1 – 10)
5. Would you hire the contractor again? (Yes or No)
6. Satisfaction rating of the manufacturer's representative (1 – 10)
7. Satisfaction rating of the value relative to the overall roofing project cost (1 – 10)
8. Overall satisfaction rating of the roofing project (1 – 10)
9. Have you used manufacturer's product more than once? (Yes or No)

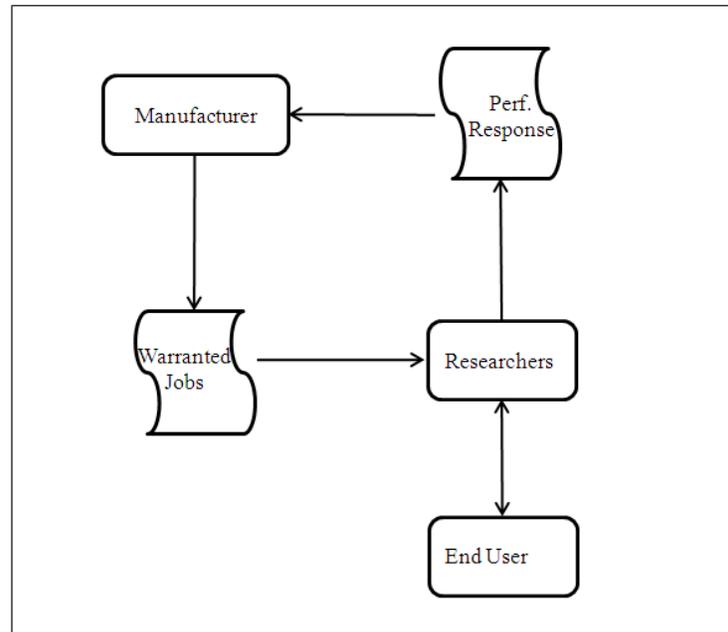


Figure 1: Warranty process

Upon completion of the satisfaction check, the performance response (performance information) is then reported back to the manufacturer. This proactive risk minimization system enables the manufacturer to identify and resolve problems upfront, rather than becoming reactive to them as they materialize in the future.

Pilot Projects

Before advancing any further, researchers recommended the manufacturer to conduct three pilot tests in order to test the ability of the warranty process to accomplish the desired goal of differentiating subject manufacturer from other competitors and minimize the risk:

- Pilot 1 - Warranty process on largest and oldest fifty projects
- Pilot 2 - Warranty process on randomized one hundred and fifty projects
- Pilot 3 - Warranty process on fifty different end user projects

Table 1 shows the performance information of three pilot tests. The data reveals that the overall satisfaction rating of the manufacturer is 9.2 out of 10. The customer satisfaction rating of the roofing system is 9.1 out of 10 and 98% of the customers would purchase the manufacturers product again. There are 99% of the projects with no leaks. However, the customer satisfaction rating of the applicator is below 9.0 indicating it is essential to identify low performing applicators i.e. contractors to minimize manufacturer's and end user's risk.

Table 1

Performance information for pilot tests

No	Criteria	Unit	Overall	Pilot 1	Pilot 2	Pilot 3
1	Overall customer satisfaction	(1-10)	9.2	8.9	9.1	9.4
2	Oldest job surveyed	Years	3	3	2	2
3	Average age of jobs surveyed	Years	1	1	1	1
4	Customer Satisfaction - Roofing System	(1-10)	9.1	8.9	9.1	9.3
5	Percent of customers that would purchase the system again	%	98%	100%	97%	100%
6	Percent of roofs with no current leaks	%	99%	98%	99%	100%
7	Customer Satisfaction – Contractor	(1-10)	8.8	8.7	8.9	8.7
8	Percent of customers that would hire same Contractor again	%	95%	98%	97%	100%
9	Customer Satisfaction – Manufacturers Representative	(1-10)	9.5	9.2	9.6	9.5
10	Customer Satisfaction - Value relative to project cost	(1-10)	8.9	8.7	8.9	8.9
11	Percent of repeat customers (surveyed)	%	N/A	N/A	N/A	77%
12	Total job area (of job surveyed)	SF	4,942,175	3,202,636	1,125,333	614,206
13	Total number of jobs surveyed	#	127	31	76	20
14	Total number of surveys	#	250	50	150	50

Table 2 shows the percentage of end users that can be contacted and the reason if the researchers were unable to contact the end user. The research revealed that only 52% of the end users could be contacted.

Table 2

Survey responses

No	Criteria	Unit	Overall	50 Projects	150 Projects	50 Diff Projects
1	Bad/Missing Information (No contact info, wrong #, etc.)	%	28.4%	34.0%	26.0%	30.0%
2	Refusal to Complete	%	2.0%	2.0%	0.7%	6.0%
3	Jobs cannot be contacted	%	15.4%	2.0%	22.6%	24.0%
4	Surveys Returned	%	51.8%	62.0%	50.6%	40.0%

Since end users play a critical role in the warranty process, it is essential that the response rate of the end users be increased. Manufacturers and the researchers agreed that the warranty process needed a twitch in order to meet its purpose to increase the response rate of the end users.

New Warranty Process

Upon addressing this issue to the manufacturer, it was revealed that the contact information was provided by the regional managers in the field and that they did not realize the importance of accurate contact information in the warranty process. In order to ensure the smooth functioning of the warranty process system it was identified that following is important:

1. Education within the organization
2. Warranted jobs to be submitted monthly to minimize the time between job completion and satisfaction check
3. Send a list of jobs that cannot be contacted to the regional managers and request the accurate contact information

Figure 2 illustrates the updated warranty process. The difference compared to the previous process is that if the end user cannot be contacted, the regional manager is responsible for providing the accurate contact information. After the accurate contact information is received, the end user is contacted again for the performance response.

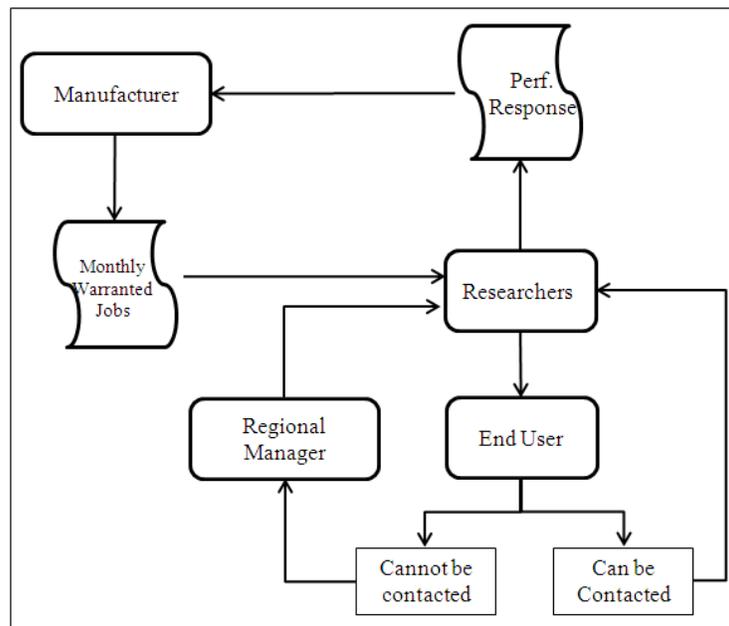


Figure 2: Updated warranty process

The new warranty process is being implemented approximately for one year. Table 3 reveals the overall performance information after the introduction of new warranty process for nine months. The data is consistent with the pilot tests where the applicator has the lowest satisfaction rating (9.0 out of 10). Satisfaction of the roofing system is 9.2 out of 10 and percentage of customers that would use the manufacturer’s product again is 98%. The overall customer satisfaction rating is 9.2 out of 10 and it was identified that fifteen of the roofs (3%) are leaking. The customer retention rate and percent of customers that would purchase manufacturers product again was high with 88% and 97% respectively.

Table 3

Overall performance information

No	Criteria	Unit	Overall
1	Overall customer satisfaction	(1-10)	9.2
2	Oldest job surveyed	Years	10
3	Average age of jobs surveyed	Years	0.8
4	Customer Satisfaction - Roofing System	(1-10)	9.2
5	Percent of customers that would purchase the system again	%	98%
6	Percent of roofs with no leaks	%	97%
7	Customer Satisfaction - Applicators	(1-10)	9.0
8	Purchase of customers that would hire same Applicator again	%	96%
9	Customer Satisfaction - Representative	(1-10)	9.5
10	Customer Satisfaction - Value relative to project cost	(1-10)	9.0
11	Percent of repeat customers	%	88%
12	Total job area (of job surveyed)	SF	9,426,705
13	Total number of jobs surveyed	#	564
14	Total number of different customers to be surveyed	#	846
15	Total number of Surveys	#	1,282

Table 4 shows that almost half of the clients are non-responsive due to incorrect contact information. The lists of jobs that do not have accurate contact information are being sent to the regional managers. Moreover, the regional managers have been educated on the warranty process and the importance of contact information. Upon receipt of the updated list, the end users will be contacted again for higher response rate.

Table 4

Overall survey responses

No	Criteria	Unit	Overall
1	Bad/Missing Information (No contact info, wrong #, etc.)	%	19.4%
2	Refusal to Complete	%	2.5%
3	Cannot be Contacted	%	29.8%
4	Surveys Returned	%	44.7%

Conclusion

The manufacturer was successfully able to implement the warranty program and measure the performance information of their systems and applicators as recommended by the researchers. Having a proof of documented performance of their systems differentiates the subject manufacturer from other competitors through performance measurement. The warranty program also benefited the manufacturer to minimize the risk not only for the manufacturer, but also for the end users by identifying

- End users that are not satisfied
- Applicators that are low performing
- Jobs that have current leaks

- Having a running log of satisfaction rating for every warranted job

The manufacturer was able to mitigate the risk proactively by identifying the unsatisfied end users and leaking jobs in the warranty process. The manufacturers are able to report these jobs to their respective managers that are responsible for their region within two weeks of notification.

The research also revealed that the product of the manufacturer is a high performing product with 98% of the clients purchasing the product again and an overall satisfaction rating of 9.2 out of 10.

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