
Using Satisfaction Ratings to Minimize Risk

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Warranties in the construction industry have become more prevalent in the last couple of decades. Moreover buyers in the construction industry rely heavily on the length of the warranties for the purchase of any product or service. The warranty is an agreement between the buyer and the manufacturer and has inclusions that if altered voids the warranty. Hence the length of the warranty has no correlation to the actual performance of the product or service being purchased. One of the manufacturers in the construction industry, in order to differentiate themselves from other manufacturers, approached the researchers to implement a system that can better assist and serve their end users beyond just providing a warranty. The purpose of this paper is to describe and analyse the warranty tracking program that tracks the installed roofing projects for the manufacturers providing an overall snapshot of the performance of all the installed projects. The warranty tracking program provides the manufacturer the risky projects (leaks, blisters, end-user dissatisfied) with the use of end-user customer satisfaction every year. The researchers also implemented the high performance roofing program and a performance-based licensure process to attract high performing applicators. Since the inception of the warranty tracking program the manufacturer has been able to resolve 69 out of 70 (98%) risky projects. In conclusion, the warranty tracking program provided the manufacturer a better way to assist and serve their end users through proactive resolution of risky projects.

Keywords: Applicator, Manufacturer, Performance information, Risk minimization, Satisfaction rating.

Introduction

The last two decades of research has revealed a poor documentation of performance in the construction industry (Cahill and Puybaraud, 1994; CFMA, 2006; Flores and Chase, 2005; Egan, 1998; Davis et. al., 2009). Every entity in the industry claims that their services / products are high performing, giving false promises to the owner. Expecting a high performing job, the owner buys a service / product, but due to poor documentation of performance, manufacturers and contractors sell products based on low price and long term warranties. The false expectation of a high performing job, the enticing low price and long term warranties incite clients to purchase products based on these contracts, which have no proven correlation to a system's performance (Kashiwagi 2011).

The manufacturer's warranty that is offered in the construction industry is provided by the manufacturer to the buyer (Agarwal et. al. 1996). The warranty is generated and written by the legal representatives of the manufacturer and contain certain exclusions that have the possibility to void the warranty (Murthy & Djameludin 2002, Christozov *et al.* 2009). Therefore if a product / service fails to perform as expected, the buyers have to prove that they did not violate the exclusions of the warranty and the manufacturer needs to also agree with the buyer (Kashiwagi, 2012). At the end, the contractor takes no accountability for their work, and the owner is dissatisfied with the service and the end product creating a "lose-lose" scenario.

This trend is dominantly seen prevalent in the manufacturing sector of the construction industry. The industry is flooded with manufacturers and contractors that sell products and systems based solely on the length of the warranties. The use of warranties for marketing is not a right approach and does not assist the end user in purchasing a quality product. Many researchers have suggested different types of risk minimization systems in attempt to change this trend. (Hillson, 1997; CII, 1995; Gibson et. al., 2006; Hamilton, 1996; Kashiwagi, 2009; Sullivan, 2010; Davis, et. al., 2009; Sweet, 2011).

The purpose of this paper is to propose a risk minimization tool with the use of warranties to improve the quality of the product and processes through the use of customer satisfaction. A coating system manufacturer in the construction study was used as a case study. The risk minimization tool proposed in this study measures the performance of the products and applicators that can minimize the risk of contractor non-performance and identify problem projects, proactively providing the end user with a quality end product.

Methodology

To minimize the risk of low performance and identify problem projects proactively three systems were developed as follows:

- A customer satisfaction performance tracking program on all warranted projects
- Creation of the elite contractor program for SPF roofing known as the Alpha Program
- Licensure process that checks the past performance of the contractors

Customer Satisfaction Performance Tracking

The researchers implemented a risk minimization program that measures the performance of all of their systems - Wall Coating, Flooring, Waterproofing, Direct Bond Roofing, and Spray Polyurethane Foam (SPF) Roofing and the performance of the applicators that install the products. In order to measure the performance of the system, clients/end users are contacted every year until the end of the warranty duration for satisfaction ratings on the product and the applicator who installed the roof system.

The risk minimization warranty program attempts to minimize risk by updating the information on:

1. Performance of the applicators
2. Performance of the products
3. Identifying dissatisfied end users
4. Identifying problem projects to mitigate the risk immediately

The risk minimization program consists of a warranty check process outlined in Figure 1. Upon finishing a project, the manufacturer initiates the warranty check process by communicating the warranty information to the research group. As soon as the warranty is issued to the end user, the research group surveys the end user with the following questions:

1. Customer satisfaction of the applicator (1 lowest– 10 highest)
2. Would you hire the applicator again? (Yes / No)

3. Customer satisfaction of the coating system (1 – 10)
4. Would you purchase the system again? (Yes / No)
5. Overall customer satisfaction (1 – 10)

The survey response information (performance information) is then reported back to the manufacturer. If dissatisfaction or an installation issue is identified in the survey, the manufacturer's customer service department is notified with the project information. 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.

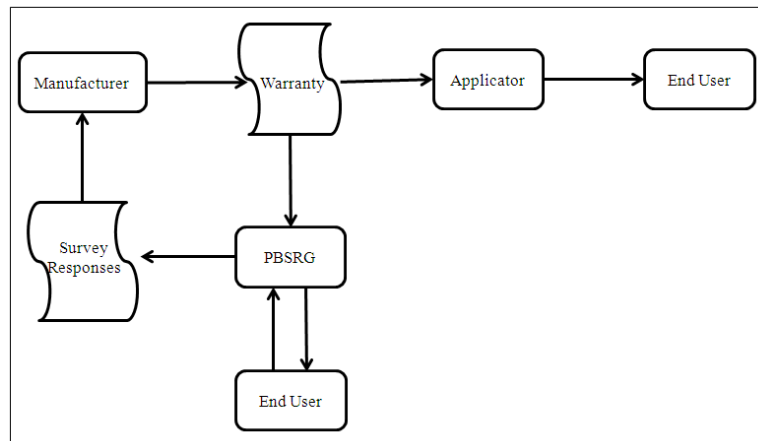


Figure 1: Warranty Check Process

Elite Contractor Program – Alpha Program

In order to attract high performance contractors a pilot program in the SPF roofing sector was created. A performance based SPF roofing program known as the Alpha program was developed for the manufacturer to motivate contractor performance and accountability. The program is the first contracting performance program that established by the manufacturer that qualifies and disqualifies applicators on performance measurements determined by the end users. The Alpha program minimizes the risk of the manufacturer by attracting and using high performing contractors. These high performing contractors eliminate rework and minimize the risk for the end user by providing a quality product installed by an expert. The Alpha program succinctly curtails litigation that is caused by improper application, motivates contractors to take accountability for their work and increases and creates a competitive market for ensured quality performance (Kashiwagi, et al. 2010).

The performance requirements for the Alpha program are:

1. Have a “good financial standing” and “be licensed” with the manufacturer
2. Roof inspections once every two years of a minimum of 25 roofs by a third-party inspector
3. Annual submission of newly installed SPF roofs over 5,000 SF to Arizona State University
4. 98% of roofs being tracked cannot currently leak.
5. 98% of surveyed roofs must have satisfied customers.
6. Attend the annual educational presentation

Licensure Process

Almost every manufacturer in the construction industry has a special licensing program that allows certain advantages for the contractors that are licensed. However, the licensure requirements are solely based on technical data like insurance requirements, credit, etc. which does not correlate to the actual performance of the contractor.

The manufacturer in this case study had a similar licensing program where the contractors that were licensed received “joint and several” warranties. Joint warranty contracts state that the responsibility to uphold specifications of the warranty is equally shared by the applicator and the manufacturer. The manufacturer identified that even some of the licensed contractors were not performing and needed a way to attract high performing contractors into the licensure program. The researchers proposed a licensing system that would severely minimize the manufacturer’s risk by disqualifying low performing applicators to receive joint warranty options. By creating a system that filters out low performing contractors, it mitigates the risk of failing warranties and litigation.

The following licensing requirements were proposed:

1. Submit a minimum of five references that validate a contractor’s credibility as a high performer. (One of the jobs must include the use of the manufacturer’s product)
2. Survey responses from the contractor’s references answering the following questions:
 - a. Customer satisfaction of the applicator (1 lowest– 10 highest)
 - b. Would you hire the applicator again? (Yes / No)
 - c. Customer satisfaction of the coating system (1 – 10)
 - d. Would you purchase the system again? (Yes / No)
 - e. Overall customer satisfaction (1 – 10)

Results

Table 1 shows the performance information of all manufacturers’ systems over the last four years. The total job area surveyed was 36.1 million square feet. The clients were satisfied with the manufacturer’s product and the applicators who installed the product. The overall customer satisfaction rating was 9.0 out of 10 with 1,412 warranted jobs surveyed.

Table 1

System Performance Information

No	Criteria	Unit	Overall	Flooring	Direct Bond Roofing	Foam Roofing	Wall Coatings	Water-proofing
1	Overall customer satisfaction	(1-10)	9.0	8.5	9.1	9.4	9.2	9.0
2	Oldest job surveyed	Years	10	5	7	6	7	9
3	Average age of jobs surveyed	Years	4	3	4	4	4	3
4	Customer Satisfaction - Coating System	(1-10)	9.1	8.3	9.2	9.5	9.2	9.0
5	Percent of customers that would purchase the product again	%	98%	90%	98%	99%	98%	98%
6	Customer Satisfaction – Applicators	(1-10)	9.0	8.4	9.0	9.3	9.2	9.0
7	Percent of customers that would hire same Applicator again	%	96%	87%	96%	95%	97%	96%
8	Total job area (of job surveyed)	SF	36.1 M	0.3 M	3.6 M	3.2 M	2.8 M	26.2 M
9	Total number of jobs surveyed	#	1,412	31	191	111	63	1,016

Table 2 shows the performance information for jobs that hold a potential risk. Jobs that have satisfaction ratings below a seven or clients that would not purchase the product again were categorized as risky. The data shows that 97% of jobs have no customer complaints and would purchase the product again. However, the risky jobs have a lower satisfaction rating of 4.1 for the coating system and 4.5 for the applicator. The risky jobs constituted only 4% of the total job area installed. The researchers send a quarterly report with a list of all identified “risky” jobs to the manufacturer’s customer service department. The customer service department then contacts the client for further investigation and takes action to satisfy the customer.

Table 2

Risky Job Performance Information

Criteria	Unit	Risky Jobs
Total number of jobs surveyed	#	1,412
Number of risky jobs	#	70
Percent of jobs that are risky	%	5%
Satisfaction rating- Coating	(1-10)	4.1
Satisfaction rating- Applicator	(1-10)	4.5
Percent of customers that would purchase the product again?	%	0%
Risky job area	SF	1.5 M

Table 3 differentiates high performing applicators from low performing applicators. Applicators that have either a satisfaction rating below a seven or a client that would not hire the applicator again, are deemed as low performing contractors. The data shows that approximately 10% of the applicators that install the manufacturer’s product are low performing applicators. Low performing applicators installed 5% of the total job area of

manufacturer's coating. Upon publishing the results, the manufacturer decided to stop selling their coating systems to the low performing applicators.

Table 3

High performing applicators vs. Low performing applicators

Criteria	Unit	High Performing Applicators	Low Performing Applicators
No. of Contractors	#	268	29
Satisfaction rating- Coating	(1-10)	9.2	7.4
Satisfaction rating- Applicator	(1-10)	9.3	6.1
Percent of customers that would hire the applicator again	%	100%	69%
Total Job Area	SF	17.2 M	1 M

High Performance Roofing Program

Applicators can be eliminated from the program if they do not meet the requirements of the Alpha program. Table 4 shows the performance ratings of the applicators currently involved in the program. The data reveals that all of the applicators are high performing applicators with 100% satisfied customers and 100% of jobs that are not currently leaking.

Table 4

Current Alpha applicator performance lines

Job	Unit	A	B	C	D	E
Overall satisfaction rating of the applicator	(1-10)	9.5	9.7	9.4	9.6	9.8
Oldest job surveyed	Years	8	13	25	29	25
Average age of jobs surveyed	Years	5	4	10	11	10
Age sum of all projects that never leaked	Years	374	161	139	391	397
Age sum of all projects that do not leak	Years	410	171	477	484	523
Percent of customers that would purchase again	%	100%	100%	100%	100%	100%
Percent of jobs that do not leak	%	100%	100%	100%	100%	100%
Percent of satisfied customers	%	100%	100%	100%	100%	100%
Average job area (of jobs surveyed and inspected)	SQ	40,038	28,941	50,927	40,111	47,481
Total job area (of job surveyed and inspected)	SQ	3.4 M	2.0 M	4.7 M	2.4 M	2.4 M
Total number of jobs surveyed telephonically	#	85	50	50	53	50
Total number of jobs inspected	#	31	52	27	28	26
Total num. of different customers surveyed & inspected	#	10	36	27	24	37

Job (cont'd)	Unit	F	G	H	I	J
Overall satisfaction rating of the applicator	(1-10)	9.7	9.6	9.7	9.8	10.0
Oldest job surveyed	Years	29	12	20	26	23
Average age of jobs surveyed	Years	11	5	10	11	13
Age sum of all projects that never leaked	Years	376	160	293	385	614
Age sum of all projects that do not leak	Years	493	232	477	598	655
Percent of customers that would purchase again	%	100%	100%	100%	100%	100%
Percent of jobs that do not leak	%	100%	100%	100%	100%	100%
Percent of satisfied customers	%	100%	100%	100%	100%	100%
Average job area (of jobs surveyed and inspected)	SQ	103,558	23,271	26,173	32,554	11,727
Total job area (of job surveyed and inspected)	SQ	5.2 M	1.7 M	1.6 M	1.8 M	0.9 M
Total number of jobs surveyed telephonically	#	50	50	50	55	50
Total number of jobs inspected	#	30	29	27	25	27
Total num. of different customers surveyed & inspected	#	11	38	27	9	28

Job (Cont'd)	Unit	K	L	M	N
Overall satisfaction rating of the applicator	(1-10)	9.8	9.5	9.8	9.8
Oldest job surveyed	Years	12	14	26	27
Average age of jobs surveyed	Years	3	6	6	18
Age sum of all projects that never leaked	Years	132	259	244	785
Age sum of all projects that do not leak	Years	159	278	258	863
Percent of customers that would purchase again	%	100%	100%	100%	100%
Percent of jobs that do not leak	%	100%	100%	100%	100%
Percent of satisfied customers	%	100%	100%	100%	100%
Average job area (of jobs surveyed and inspected)	SQ	21,561	11,363	17,126	19,489
Total job area (of job surveyed and inspected)	SQ	1.3 M	0.6 M	1.0 M	1.0 M
Total number of jobs surveyed telephonically	#	51	50	54	49
Total number of jobs inspected	#	52	47	29	51
Total num. of different customers surveyed & inspected	#	33	41	21	6

Table 5 shows the overall performance line of the applicators since the inception of the Alpha program. The data shows that the average overall satisfaction rating of the applicators is 9.4

out of 10 with 100% of jobs that are leak free and 99% of the customers satisfied with the job. The total roof area that have been surveyed and inspected since the beginning of the Alpha program has been 80 million square feet.

Table 5

Overall Performance Line

Job	Unit	Overall
Overall satisfaction rating of the applicator	(1-10)	9.4
Oldest job surveyed	Years	33
Average age of jobs surveyed	Years	8
Age sum of all projects that never leaked	Years	10,144
Age sum of all projects that do not leak	Years	14,166
Percent of customers that would purchase again	%	100%
Percent of jobs that do not leak	%	100%
Percent of jobs completed on time	%	99%
Percent of satisfied customers	%	99%
Total job area (of job surveyed and inspected)	SQ	80 M

Performance Based Licensure Process

The installed risk minimization system showed that 10% of the manufacturer’s applicators were low performing.

Table 6 shows that 72% of the applicators that applied did not get licensed after the introduction of the manufacturer’s licensing system. Many of the applicators were disqualified due to non-experience of using the manufacturer’s product.

Table 6

Applicator Licensure Analysis

Criteria	Data
Total number of applicators who applied for licensure	271
Number of applicators licensed	77
Percent of applicators that did not get licensed	72%
Average satisfaction rating of licensed applicators	9.5

Conclusion

The manufacturer has successfully identified itself as a manufacturer of a high performance coating system.

This manufacturer has implemented a performance based risk minimization program that not only measures the performance of their coating system, but also the applicators installing the coating system through the tracking of warranties. The manufacturer’s risk minimization program helps the manufacturer differentiate themselves from other manufacturers that sell products based on warranty and low price by organizing a database of vendor performance and end user satisfaction.

The high performance roofing program known as the Alpha program increased the accountability of the applicator through the use of documented performance information and

likewise minimizing the manufacturer and the client's risk. The research showed that 100% of the roofs installed by the Alpha applicators are leak-free and 99% of the end users were satisfied with the job. The Alpha program helps the manufacturer minimize litigation and risk through the use of performance check-ups, licensing practices and inspection programs. This program not only provides an on-going development feedback system to better serve clients, but helps contractors to compete in a high performance based environment.

The licensing system filtered out low performing applicators from installing the manufacturer's product. The references check requirement minimized the risk of the manufacturer by filtering out low performing applicators from using their product.

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