

What is Systemkey™?


By Matt Weilert


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The Systemkey™ Project is transforming the way risk gets measured and managed with SMART Sharing, a human-centered data integration tool that collects risk elements enterprise-wide, delivering more timely, more accurate risk rankings. The trillion dollars spent to hedge risks each year hasn't prevented the BPs, 3 Mile Islands & other headline disasters. Systemkey's global reach and scalable focus is vital to close the gaps in today's existing risk practices. Lower risk profiles allow money formerly earmarked for insurance to get used on more sustainable causes. People from over a dozen countries have gained insight from the Systemkey advantage.

What are the results?

Along the way of developing and maturing a robust and scalable risk analysis product, we've delivered some amazing results:

 In WA state, for a Department of Energy contractor, we convinced 3300 people spread across 28 states to make daily decisions for safe driving that took this contractor, Battelle, from leading all DoE in motor vehicle accidents, to a zero-reportables year! To those who say that people won't read anything these days, last time I checked J.K. Rowling has sold a cruiseship-full of really thick books! By our results, we know that Systemkey produced durable and resilient behavior change over an entire year.

 In NV, for an auto-parts warehouse, we engaged both rank & file labor and management with the proprietary Systemkey combination of simple questions and hard core data analysis, to solve why their main warehouse conveyor system broke down every day at 2 pm. By solving what turned out to be a people-problem with a data-driven solution, we saved GM's Sparks, NV warehouse over \$300K/month! For the CFOs out there, that's less than a two-month payback.

 In MN, for a Defense industry manufacturer, we delivered the required safety reporting on a missile canister design in 4 months instead of the contractor average 16 months! That means the team could have handled four times as many projects.

Why should I spend the money?

Systemkey will allow the CFO to cost-justify spending to make something *NOT* happen. In other words, the data collection and data transparency that Systemkey produces give the CFO the documentation they need to demonstrate the benefits, (both net present value and life-cycle cost), that are absolutely required to change processes, product lines and behaviors, to not only mitigate disasters but also to deliver operational improvements that other risk tools aren't even designed to find.

Dead Data or Vibrant Conversations?

Figures on a page in a report on a shelf don't do much for anyone. The structured conversations at the heart of the Systemkey™ approach take place within the ordinary course of day-to-day business, they're not a tack-on flavor-of-the-month. Systemkey's questioning and data-slicing inspire improved behavior ([contact us](#) for the *who, why & how!*); improved behavior drives improved results. Our field trials across three distinct business areas show that Systemkey can be tailored for any industry vertical.

One of my friends used to be the CFO of Viking River Cruises. Inspired by Bob's raw awesomeness, let's take life boat maintenance as an example of how Systemkey adds value. Now for myself personally, I haven't been on a vessel as big as a cruise ship since I left the Navy, but I'm guessing that seawater is still pretty much the same and physics hasn't changed, so this should pretty much hold true.

The Systemkey™ risk assessment approach, SMART Sharing, scales up for more complex matters (which they all do), but unlike the rest of the universe of risk assessment and reporting tools, Systemkey will also scale *DOWN* for reduced overhead on simpler projects.

Lifeboat Lifting Arm (Davit) Lifecycle Total Cost of Ownership

Our example is calculating the total cost of lifecycle maintenance on the davit of a lifeboat. For our non-maritime readers, the davit is the lifting arm that pivots the lifeboat into the water. After analyzing lots of these, the engineers in our made-up example determined that corrosion was the dominant cause of premature davit failure. Davit arms were failing at two year intervals, drastically shorter than the 15-year projected life. The spreadsheet clips show details of Expected, Actual and Risk-Adjusted Lifecycle Cost.



Image courtesy of Nautic Expo

The Systemkey Secret Sauce is the seasoned veterans talking with the new hires/interns. Just like the “Toyota Way” was actually inspired by the flowracks at A&P Grocery markets, the half-day Systemkey training is essentially teaching the “5S” and “5 Whys” kanban techniques transferred into a question sequence. (More detail on the questions is below in the next section.)

Expected Maintenance Costs

Part	Qty	Unit	Sched Replace freq	Unit	Part Repl cost	Maint Hr to Repl (Each)	\$Labor/ Hr	\$ Total Labor	\$ Total Parts	\$ Total Supplies	Expected Replacement Cost/15yr
Davit Arm	1	ea	15	yr	\$2,000	300	75	\$22,500	\$2,000		\$24,500
Grease	200	g	3	mo	\$18	1	35	\$12,600		\$1,296	\$13,896
O-ring	6	ea	2	yr	\$4	1	50	\$2,250	\$180		\$2,430
\$40,826											

Because of this vessel's modified mission, the lifeboats were getting used in routine maintenance activities, rather than just crew/passenger rescue, even though the configuration was not rated for this level of use. *(Note that we focused on solving the issue at hand, not why they were working outside their rating.)*

The Systemkey Secret Sauce mentioned above bears fruit from “listening to the old salts” — a phrase that may’ve dropped out of common use yet deserves a new day. Through the relationship developed in the unique Systemkey structured questioning, the ship's engineer contacted a test-lab-specialist who was a former classmate of the maritime intern.

Actual Maintenance Costs

EVERY TWO YEARS

Part	Qty	Unit	Sched Replace freq	Unit	Part Repl cost	Maint Hr to Repl (Each)	\$Labor/Hr	\$ Total Labor	\$ Total Parts	\$ Total Supplies	Actual/Current Replacement Cost/15yr
Davit Arm	1	ea	2	yr	\$2,000	300	75	\$22,500	\$2,000		\$183,750
Grease	200	g	3	mo	\$18	1	35	\$1,680		\$173	\$13,896
O-ring	6	ea	0.5	yr	\$4	1	50	\$1,200	\$96		\$31,104
											\$228,750

The test lab determined that the O-rings were degrading within the month at current use rates. The Systemkey-inspired solution was to *replace the O-rings at a rate 24 times that of the expected maintenance* for this vessel! The attached chart shows that this is a lifecycle cost advantage, given that that the arms were failing seven times faster than expected.

Risk-Adjusted Maintenance Costs

Part	Qty	Unit	Sched Replace freq	Unit	Part Repl cost	Maint Hr to Repl (Each)	\$Labor/Hr	\$ Total Labor	\$ Total Parts	\$ Total Supplies	Risk-Adjusted Actual Replacement Cost/15yr
Davit Arm	1	ea	15	Yr	\$2,000	300	75	\$22,500	\$2,000		\$24,500
Grease	200	g	1	Mo	\$18	1	35	\$37,800		\$3,888	\$41,688
O-ring	6	ea	1	Mo	\$4	1	50	\$4,500	\$360		\$116,640
											\$182,828

This example also points out the fresh perspective that Systemkey makes visible. By giving a framework to create conversations around the data, *Systemkey leverages the whole brain of your whole workforce!*

Not mesmerized by numbers

Focusing on the over-arching goal, increasing the useful life of the davit, rather than getting lost in the weeds of individual budget line items, delivers a life-cycle savings *more than the originally budgeted total!* We shift our focus where required, we're not mesmerized by numbers.

Original Budget		Actual Operation
\$40,826		\$228,750
less Risk-adjusted Procedures	-	\$182,828
Savings		\$45,922

SMART Sharing delivers a way to see the forest and the trees, by integrating the disciplines of systems thinking and systems engineering. The davit arm corroding is the actual event that causes the failure, not the o-ring, even though the o-ring allows the water in that creates the conditions that lead to the corrosion. That slight word change and focus *does make a difference* because when we're tracing a complex system, the Systemkey requirement for traceability means backtracking takes a few seconds, not hours, days or weeks.

The severity of the davit arm corroding is much higher than the o-ring degrading. *We have just shown replacing the o-ring to be economically viable at 24x normal maintenance!* Other risk assessment tools may have ranked the o-ring higher because its failure allows the seawater to corrode the davit arm lift cylinder. Because other industry tools lack the big-picture framework that Systemkey brings to complex systems analysis, they collapse reality (eliminate or neglect detail) to match the tool, so the results obtained have the same lack of fidelity to reality as the inputs.

Why (& how) do we get to the better questions?



The Systemkey syntax drives the questions: **Category-Condition-Cause-Type/Case**, so in our case, knowing that corrosion is an issue, we have a starting point. If we were new on the scene, like an intern might be, the product lifecycle guides us in the first round of questions. A SMART Sharing event summary of the corroded davit arm which breaks (fails):

mLOt/fbPr[cor]rr(+) which is a shorthand for

Category: matter

Condition: Lifecycle · Operation · tooling/fixture

Cause: breaks/ fails in service · Procedure · corrosive

Type/Case: real reported · overlimit

and in a networked environment, these tags would link to deeper layers of detail as required, such as maintenance procedures, scanned logbook pages, part ordering portal, etc. to make the Systemkey risk reduction solution as tailored to the unique company needs as they choose.

For more information

Visit: www.systemkey.net/download for video, a presentation, a white paper, a special academic alliance invitation and more!