



RISK MITIGATION IN REQUIREMENTS:

The High Cost of Poor Requirements



INTRODUCTION

You have a problem. Your requirements are bad.

Now you are thinking to yourself, I have been doing my job for years, developing technologies that work, with requirements that “work.”

Do you think those who follow the status quo will be industry leaders? Will your current traditional methods keep you competitive? Will legacy always work? It’s not just a **you** problem, each sector is experiencing the same issue.

The current design process is causing the progression of innovation to stall. We spend more money, involve more people, with higher levels of education, to produce fewer ideas. To sustain constant growth in GDP per person, the United States must double [research efforts every 13 years](#) to offset the increased difficulty of finding new ideas. The [burden](#) of knowledge required to innovate is growing.

Reviewing the design process, it may be hard to pinpoint where improvement can be found. But we’ve found it, and it’s at the very beginning.

You may not think requirements are the limiting agent within your design process, but we know they are. Errors within your system are not cordial, they will not make themselves known. They fester throughout your design process costing you valuable resources in time, money, and people. Your satisfaction in your job and meeting the status quo does not indicate that a project may be error-free.

Legacy engineering processes will not design revolutionary products. To produce innovation your design process must be innovative. The technology leaders of tomorrow will be those who choose to innovate their design process today. Welcome to the fourth industrial revolution; you need to integrate technology and automated practices with communication and traditional methods to maintain industry advantage.

Now more than ever, communication must be intentional, explicit, and succinct. The most enduring record of communication remains the written word, particularly for requirements specifications. Without a common shared understanding, any artifact derived from requirements will not and cannot be correct.

Three decades of research have shown that up to 80% of product defects can be avoided if detected during the requirements stage. If those defects lurk throughout the development stages, the severity compounds over time. Although collaboration and workflow management tools are important, in the end - as it was in the beginning - content is king. What matters most is the quality of your requirements, and how soon you can get to that quality.

Problem Requirements

At this point, you may be considering the true risk of poor requirements but comforting yourself with the fact that you have hundreds of requirements. You've properly outlined the full scope of your project, and perhaps provided user stories - even if some requirements are less-than-perfect, your quantity can override quality. This thinking is ineffective.

Data from QVscribe, QRA's requirements analyzer, identified that an average of 34/184 requirements have a QVscribe score of 1/5. That means an average of 18.5% of your requirements are high-risk and pose the largest threat to the organization... now how confident do you feel?

Exploring the relative severity and resources these 34 requirements drain from your project, risk management in the requirement stage becomes much more compelling.

Error correction is not the issue — the timing of the error correction is.



Relative Severity

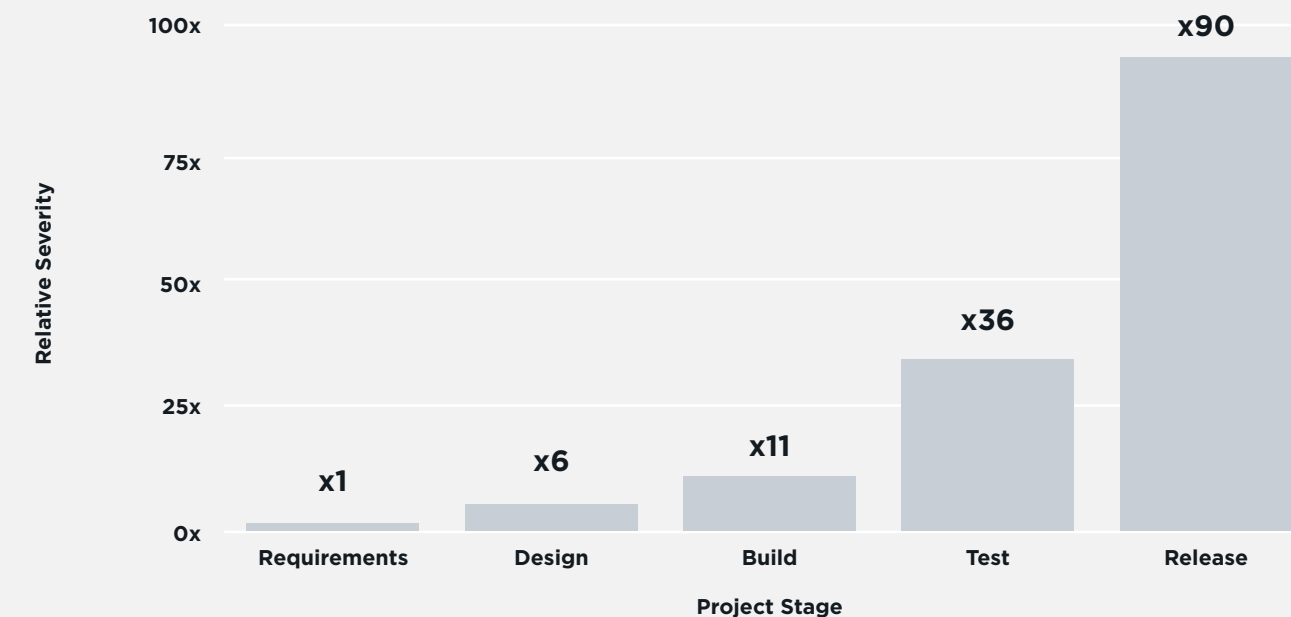
Research points towards risk management earlier in the design process. Well-written requirements generate better ROI for your organization. Accurately assess the resources you need to complete a project at the beginning stages of that project, ensuring adequate budget, time, and support.

Implement automation in the requirements stage of a project and bring a new level of optimization to your design process; you can get more done with your invaluable human resources. This becomes essential as you scale your company and technology to meet your customer's needs and compete

in the ever-changing market. Failure to mitigate risk at the beginning stages results in weak requirements, that allow inaccuracies to seep into your project. As the errors in problem requirements continue through the design process the aftereffect becomes more severe, and the cost to rectify this error substantially increases. But by exactly how much?

Averaging the data from our research, we have calculated the relative severity related to the impact of errors at each point in a project's stage. These ratios are a multiplier, reflecting the resources required to fix an error as it travels through a project's stages.

Graph 1: Relative Severity vs Project Stage



Timing Resources

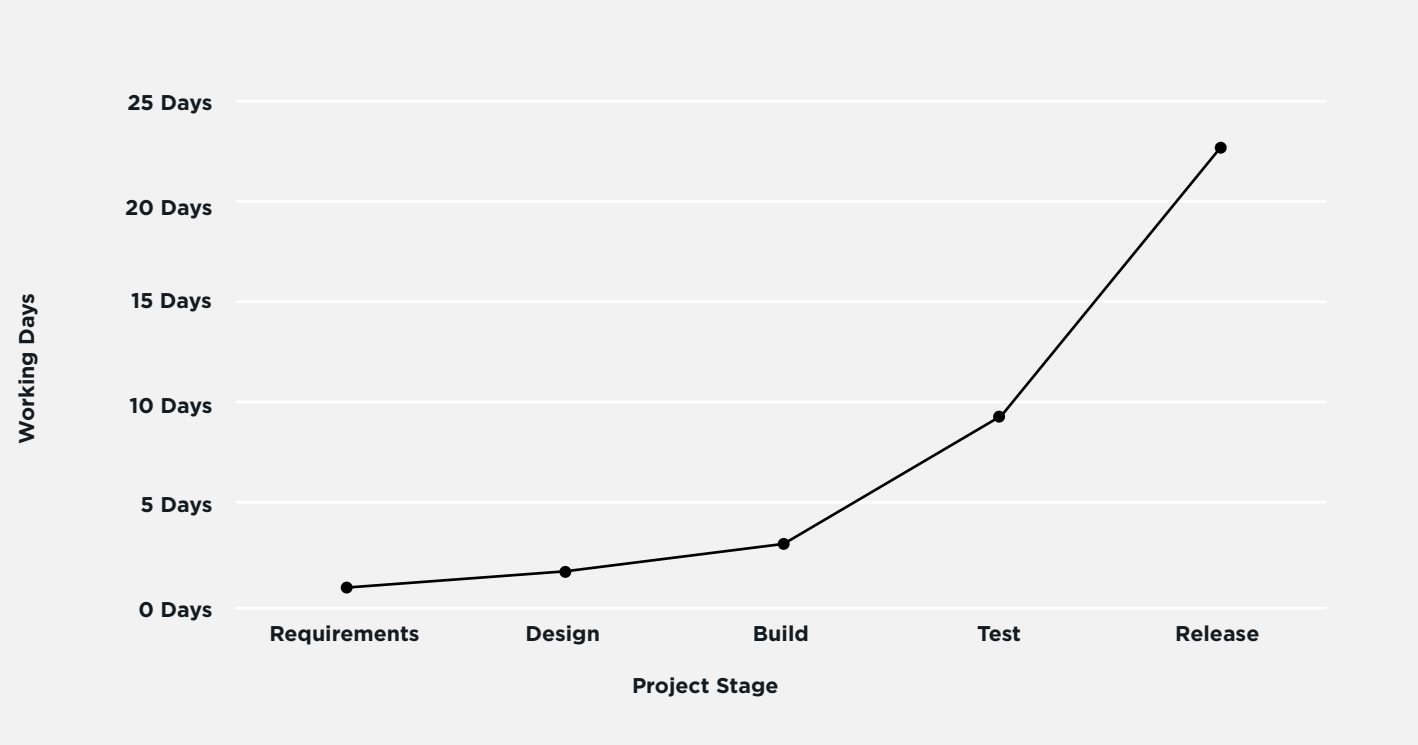
To better comprehend just how much time a poor requirement can take up, we have applied the relative severity values to the general time-related resources associated with one engineering professional fixing one poor requirement. When viewing the data, imagine at each stage an individual being pulled from your

team. An error in the earliest stages would pull them away for a couple of hours at most. But as the error traverses down the project stage, they would be gone for days or even a month, for a single requirement.

Table 1: Working Days Needed to Fix a Poor Requirement

Project Stage	Relative Severity	Number of Hours to Fix a High-Risk Requirement	Working Days to Fix a High-Risk Requirement
Requirements	1	2	0.25
Design	6	12	1.5
Build	11	22	2.75
Test	36	72	9
Release	90	180	22.5

Graph 2: Working Days Needed to Fix a Poor Requirement vs Project Stage



Financial Resources

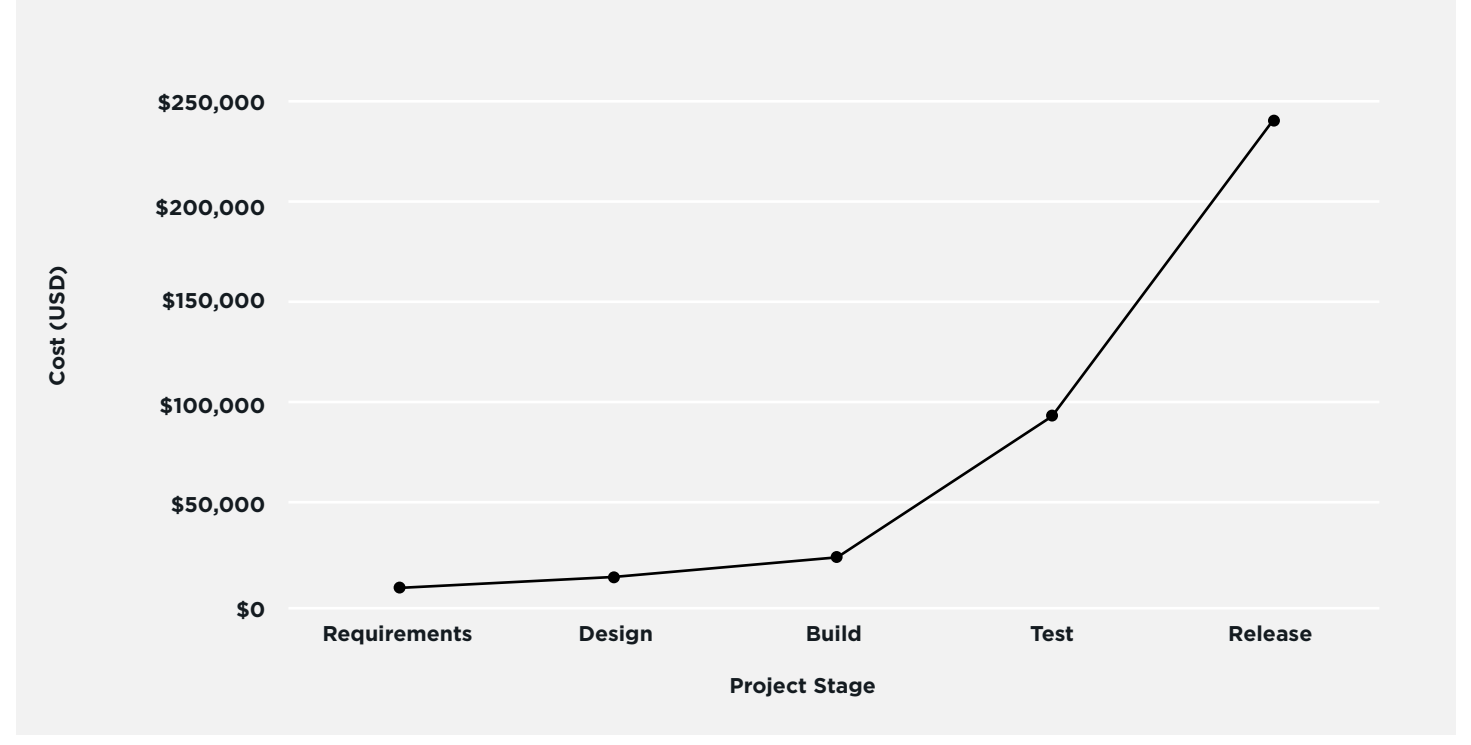
Expanding upon the data calculated in the earlier section and pairing it with an average salary range, the monetary impact of poor requirements can be illustrated. An 8-hour working day was assumed, with 1,992 hours annually, at a \$40 hourly rate.

It is unlikely that only one engineer would bear the sole responsibility for these 34 requirements, realistically it would be a team effort. However, calculating the cost of one engineer's efforts to fix these requirements at each design stage, once again provides perspective on the high cost of poor requirements.

Table 2: Cost to Fix 34 Poor Requirements

Project Stage	Relative Severity	Cost to Fix 34 High-Risk Requirements (USD)
Requirements	1	\$2,720
Design	6	\$16,320
Build	11	\$29,920
Test	36	\$97,920
Release	90	\$244,800

Graph 3: Cost to Fix 34 Poor Requirements vs Project Stage





ROI

No matter the industry, if you aim to be innovative, any one of these graphs alone should convince you that risk management earlier in the project life cycle is critical. If left unchecked, you are squandering a month's worth of an engineer's time and a quarter of a million dollars because of 34 requirements.

The return on investment is clear. If you wait till the release stage of a project for error detection, you waste resources, you lose money, and you drop the competitive edge. We know this is happening in multiple industries. In fact, [40-50% of the time](#) a software specialist spends is on avoidable rework rather than value-added work. Even if your company doesn't specialize in software, the statistic highlights a sobering fact: **resources are succumbing to human error.**

How do we ensure proper resource management? How do we guarantee progression? Just as human creativity will always progress, so will human error. The solution is not to limit human contributions but to provide our engineers with the right tools, at the right time — exactly when the error occurs.

Why QVscribe Works

Engineers are rarely trained in writing requirements. It is a skill grandfathered from other engineers who also weren't professionally trained in requirements. It's hard to identify problems in a process you don't fully understand or appreciate.

QVscribe corrects the incipit of the problem. Our software delivers industry and organizational-specific standards to requirements when written — errors won't make it past the documentation step. Save resources by limiting the requirement 'churn' and reducing the initial authoring time, allowing your top engineers to focus on value-added work, not rework.

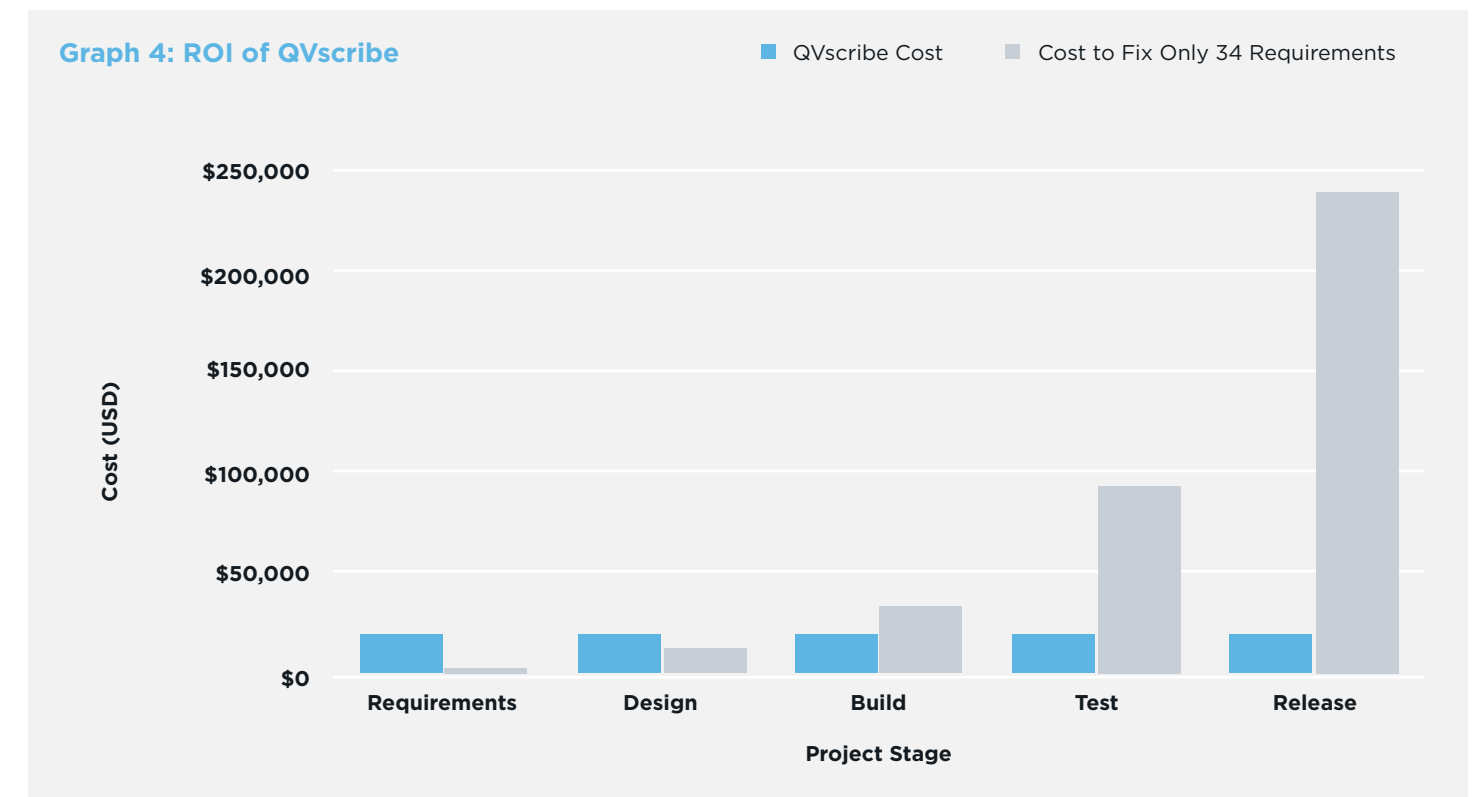
QVscribe is designed with the framework that QRA was founded on: produce a solution, not a product. QVscribe is not a requirement management platform, it is a tool that allows you to author requirements in a clear, consistent, and compliant manner.

Line-by-line checks for errors using Natural Language Processing ensure each requirement is a single thought, free of vague language, and compliant with INCOSE standards. A floating license model guarantees your entire team can use QVscribe over multiple projects. User-specified reports illustrate a user's requirement journey through a project and over their career, giving valuable insights into their authoring style.

QVscribe was designed with flexibility in mind. Available on multiple platforms, QVscribe integrates with your pre-existing requirement authoring process.

QRA's consistent curiosity to problem solve is the driving force behind product development. As your design process progresses, and problems change, so too does QVscribe, updating its platform to better serve you. Constant connection with our user base means we understand the pain points of requirement authors and design software to ease their life.

QRA has reimagined the requirements process, implementing risk management within the authoring of requirements. By limiting the errors in the initial stage of a project, QVscribe saves you the time and money associated with fixing late-stage issues.



CONCLUSION

Your engineers are facing new challenges. Automation is evolving design and fabrication, new technology is pushing the boundaries of possibility, and global offices are altering the availability and cost of human capital.

It's time to embrace change, inspect your current status quo, and optimize your processes. QRA's mission is to help our customers through this transition.

We are the market leader in applying stringent, explainable, and quantitative metrics that help engineers write better requirements, anchoring the accuracy of your project. In this competitive environment, do you want to survive or thrive?

Learn how QVscribe can transform your design process: [Book a demo.](#)

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