

A Quality and Reliability Institute at Syracuse University

Technical Proposal

Jorge Luis Romeu, Ph.D.
C. Stat. Fellow RSS, CRE, Senior Member ASQ
Research Professor, Dept. Mech. & Aerosp. Engineering
Syracuse University

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Executive Summary:

Manufacturing and services in the US are facing real and/or perceived problems of inadequacies in quality and reliability of products and services. For example, the three automobile manufacturers (GM, Ford, and Chrysler) have gone (or are going) through such problems, with the corresponding loss of market size, revenue, jobs and reputation.

This is so, because Quality and Reliability (Q&R) are two of the most important characteristics of products and services. They are defined by customer satisfaction and affect their allegiance and support to the providing organizations. Therefore, one strategy to address Q&R problems and perceptions is to identify problem areas that create them and correct them, through Q&R analyses of industrial and service organizations.

Such strategies have not been generally adopted because they do not come at bargain prices. Q&R departments (or full time staff) are often unaffordable for small and medium sized companies. In addition, there are few Q&R engineering curriculums in the US, Hence, well trained engineers in such specialties are scarce and have to be substituted by engineers trained in other specialties, that are later retrained to also perform Q&R duties.

Larger organizations (e.g. GE, DuPont) provide the service through their Q&R divisions. DOD, through their (RAC, now RIAC) Reliability Information Analysis Center), serves all its branches and their contractors. In some large industrial centers (e.g. Dearborn, MI, Rochester, NY) companies have joined to develop industry-university “institutes” (e.g. the Center for Eng. Educ. and Practice, UMichigan; the Hromi Center of RIT).

But in areas such as Syracuse such institutes do not exist. Hence, mid sized and small organizations, often subcontractors of larger corporations are left out. They need to train their engineers in Q&R specialties, but find that CNY universities (including SU) do not offer such courses. In addition, existing individual training mechanisms such as Q&R certification procedures, workshops, etc. are weakly if at all supported in our area.

The present proposal intends to fill such a void by creating a Q&R Institute at Syracuse University: a partnership between industry and service organizations, government, and the professional associations. The proposed Institute would provide training for all CNY practicing engineers through formal SU courses and informal workshops and short

courses. It would provide Q&R assessments to small and mid sized organization that cannot afford them otherwise. Finally, the Institute would work with local High Schools and their pre-engineering teachers to attract more students into science and engineering.

Specifically, the Q&R Institute would pursue this, through five well-defined functions:

1. Teach a Q&R (500-level) college course to prepare both, undergraduate and graduate (MS) students as well as practicing engineers, to work in Q&R.
2. Implement no-cost or low-cost R&Q assessments to small and middle sized industrial and service organizations of CNY, using Institute intern students, thus providing hands-on experience on Q&R to future generations of engineers.
3. Develop Web tutorials on Q&R topics to be used both in Q&R courses, seminars and workshops, as well as for self-instruction.
4. Develop systematic talks, presentations, practical workshops and short courses for professionals and staff of local organizations, jointly developed with professional societies and including participation from High School pre-engineering teachers
5. Host, jointly with the university and professional societies, all types of activities that nurture a forum on Q&R for CNY organizations. In particular, we pursue the development of a road-map for self study of web-based Q&R material

The proposed 'institute' differs from others existing ones, elsewhere in the nation in the latter area: the development of a system of web-based Q&R instructional material for the practicing engineer. We plan, once this Institute is established, to submit proposals to the NSF, NIST, DOD, DOE and other agencies, seeking support for developing web-based professional enhancement systems. For, the life-long learning and specialization of our professional work force, through web-based materials, is one of the most efficient and economic ways to ensure that they stay updated in today's fast-moving world.

Summarizing, our proposed Institute will approach the Q&R problem in four areas. First, for large local organizations, it will provide SU courses, workshops, etc., for their own engineers. Secondly, for the medium and small organizations, it will provide low or no cost Q&R assessments and consulting. Thirdly, for CNY practicing professionals, it will provide a system of web-based tutorials, as well as seminars, workshops and certification training. Lastly, for future generations, it will help enhance the pre-engineering programs in our local HS by including their teachers in our seminars and other activities.

With these activities the Institute seeks to address Q&R deficiencies that increase cost, thereby strengthening the competitiveness of CNY service and manufacturing organizations, enhancing their revenues and market shares, improving, keeping and enlarging their labor force. All of these measures will, in turn, support government services, increase CNY tax base and contribute to raise the quality of life of our community and its members.