

## VERIFICATION AND VALIDATION OF MODELS, SIMULATIONS AND SERIOUS-GAMES

Does your costly simulation-based solution provide the anticipated quality and benefits? If not, does this bring your business at risk? Q-tility offers verification and validation services that help your organization mitigate these risks and get quality simulation-based solutions with a better return on investment.

The major key to a successful development and usage of models, simulations and serious games (M&S) lies in a proper approach to verification and validation (V&V). Clearly, today's M&S solutions comprise a complex combination of people, hard- and software technology and models. These models are an abstract approximation of reality, having uncertainties. This all makes it intricately difficult to assure the validity of M&S. And this is exactly what Q-tility's offers: efficient and effective V&V solutions to gain insight into and advice on M&S quality, and use risks. With our V&V solutions clients can take timely and evidence-based decisions to avoid costs and risks associated with poor M&S quality. As such Q-tility helps clients to save money and reduce (operational) use risks by helping them to develop and acquire better quality M&S products; products that meet our clients anticipated benefits and ensure their return on investment.





## Our Value

Q-tility is a premier cooperation of NLR and TNO specializing in verification and validation solutions for models, simulations and serious-games. Both partners are well established independent R&D organizations in the area of M&S, each with an impressive track record to prove it. Q-tility's strength is the unique combination of this extensive V&V knowledge with deep application domain specific knowledge of both parent organizations. This allows us to perform independent and objective V&V in virtually all problem and application domains. Many M&S professionals and organizations have gained valuable and directly applicable V&V knowledge through Q-tility's real-life experience that allowed them to grow their M&S business professionally and successfully. Led by two recognized and pioneering leaders in the area of V&V of M&S, you can trust Q-tility to deliver turnkey V&V solutions that help you to assure that you acquire or develop the right quality M&S product (i.e. with appropriate level of utility and realism), reduce their life-cycle costs and use risks.

*Verification and validation is a real profession  
It requires knowledgeable and skillful professionals*

## Our Experience

Q-tility can rely on many years of experience in the V&V of models, simulations and serious-games. Since the mid-nineties we have applied our V&V solutions in many national and international M&S projects within the aerospace, maritime, defense, safety and security domain. We have successfully performed V&V for government agencies, industry and regulation authorities, with happy and reference-able clients. Not only have we focused our V&V activities on advanced and complex simulators, but also on COTS simulation technology and serious games. Our skillful V&V professionals have their roots in one or more M&S application and problem domains. As such they understand your problems and have the real-world knowledge to deliver the best V&V solutions with proven practices. In addition, our principles have more than a decade of experience and strongly lead Q-tility with the most recent V&V methodologies, techniques and tools. Moreover, Q-tility's principles stood at the basis of a new international industrial and NATO standard for V&V, the Generic Methodology for Verification and Validation (GM-VV), and contributed to many others.

*"We lead the way in maximizing your simulation business  
We do more than just checking simulations"*



## Our Services

Q-tility provides complete verification and validation services for M&S projects, either for clients that acquire, develop, or use M&S products. These V&V services are based on our unique proven V&V life-cycle model and involve management, planning, design, implementation, execution, results analysis and reporting for any level of V&V in your M&S project. Since our V&V life-cycle model is scalable and tailorable, Q-tility is able to provide V&V services that always meets the clients budget, time-frame and business needs. Instead of doing the V&V work for clients, we can also help clients to do V&V themselves by coordinating and setting-up a V&V activities and teams, and transitioning these into the client organization. Moreover, Q-tility provides hands-on training courses that help clients to increase the V&V competence level of their M&S personnel, novice or expert alike. Q-tility also offers customized consultancy services that not only help solve your V&V challenges, but provide the advice, research and development tools to make your M&S business successful. We offer clients the possibility of quick-scans, in short engagements, to help introduce or decided on V&V inside their M&S project or organization, effectively and efficiently.

## Our Approach

Due to our business-driven V&V approach, Q-tility is able to perform V&V activities that give clients the optimum balance between results, use risk, cost and time. In addition, our approach provides clients with a V&V life-cycle process that is fully evidence-based, traceable, transparent, auditable and reproducible. This not only gives the clients defensible V&V results but also the ability to manage the V&V process and rigor, according to the "good is good enough" principle; an approach which is unmatched by others. It helps our clients to make timely and well-informed (acceptance) decisions throughout the whole M&S life-cycle to develop or acquire the right-sized quality M&S product they really need, while staying within their available project budget and timeframe. This is the true business value and justification for clients to select Q-tility for V&V activities in their M&S project or organization.

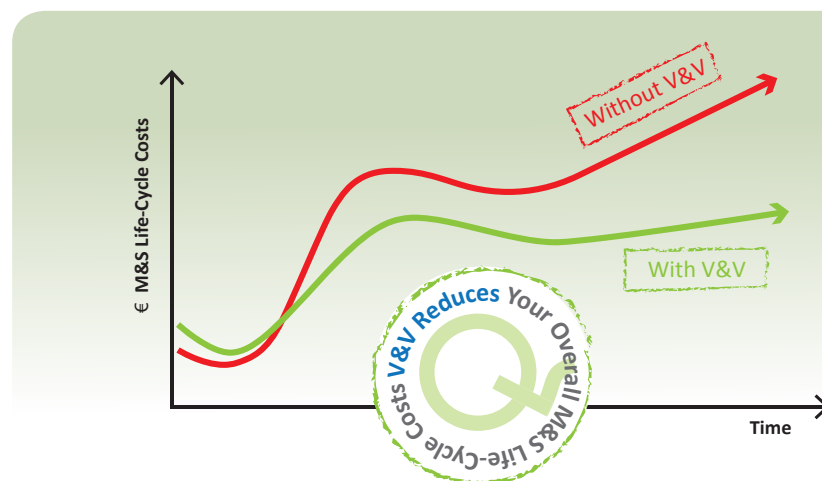
*"Q-tility provides you with the insight and advise to make  
the right investments for our training simulators"*





## The bottom line

Many models, simulations and serious-games are not verified and validated properly before being released or used, costing organizations huge sums of money, wasting time and put them at operational or business risks. Smart organizations are figuring out how to save this money and mitigate risks by making structured verification and validation an integral part of their acquisition or development process. Independent professional V&V service providers bring objectivity, transparency, traceability and efficiency to M&S quality assessment and improve the core business strategy. After working with Q-tility, you will have insight in the quality of your M&S products and associated use risks, understand the opportunities to improve them, have a plan for making those improvements, and have the assistance of world class experts to help you along the way. In this way Q-tility will help you to maximize your return on investment, and transform your organization into a smart buyer or producer of quality M&S products that meet their expected benefits.



*For support in finding, developing and applying solutions for your particular verification and validation problem in any model, simulation or serious game.*

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