**SODIUS WILLERT**

# SUCCESSFULLY
# SPECIFY, DEVELOP & TEST
SYSTEMS WITH
EMBEDDED SOFTWARE

## SODIUS WILLERT GROUP

- Willert Software Tools GmbH
- Sodius SAS
- Sodius Corp
- 321 Gang Inc

# ENGINEERING
## FOR COMPLEX SYSTEMS

*What do you do to control the complexity of your projects?*

We support you with the selection, introduction and application of adequate tools, processes and methods for your engineering projects. SodiusWillert has specialized on developing high-performance add-ons for market-leading systems and software engineering tools.

**We help you get your products to market faster and with higher quality by integrating development tools, increasing team productivity and fostering team collaboration.**

## A successful development project is based on these pillars:

**Craftmanship** Relevant experience, knowledge and skills of the experts involved

**Processes** Defined and practiced processes, communication and interaction within the team and with all stakeholders

**Methods** Development methods and best practices

**Tools** Tools that facilitate the work of experts and support the adoption of engineering methods

**People** Sufficient manpower for the implementation of the project
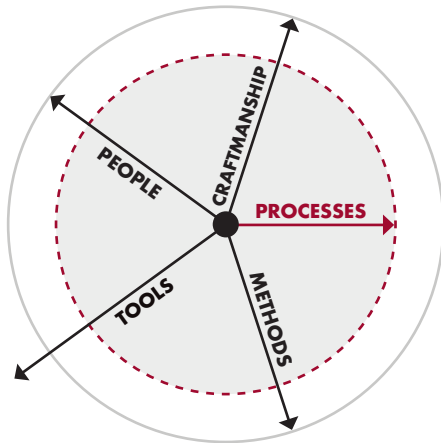


The maturity level of a project environment is determined by the weakest element. If any of the resources is insufficiently sized, this deficit cannot be compensated by reinforcing another resource. An poorly defined or not practiced process cannot be compensated by, for example, more tools.



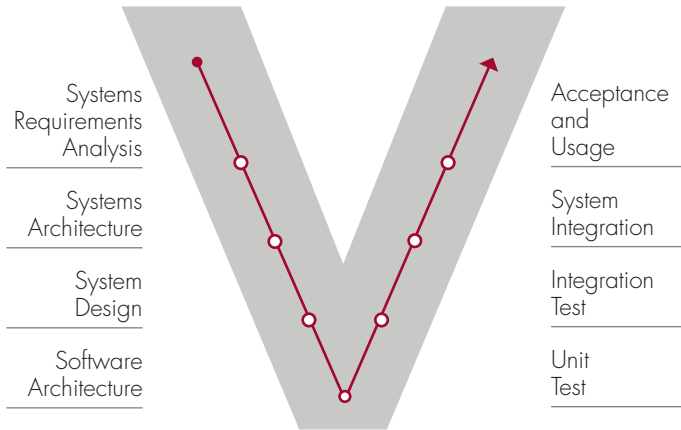*Products of SodiusWillert customers*

### Where to begin?
Many engineering companies have a very clear vision of a state or capabilities they want to have implemented at the end of a change initiative. However, in most cases, the biggest risk is not the lack of clarity about the goal. Often, the issue is precisely analyzing the current situation in all dimensions: Process, methods, tools, people. A lack of clarity about the current situation entails major risks for planning and for taking the path towards the goal.

### Understand the current situation!
It often helps to first look at the current project situation and how work is being done in reality. If possible, remain open to results, even for any unexpected findings. You certainly know exactly which tools are used at which points. Nevertheless, deviations from the original planning may occur over time, and there are certainly good reasons for that. From your findings, you can derive conclusions regarding current bottlenecks and gain valuable insights for your further planning.

The goal is to get to a realistic picture of the initial situation. This will also help you to prioritize, enabling you to take well-founded decisions about which points you want to tackle and in what order.
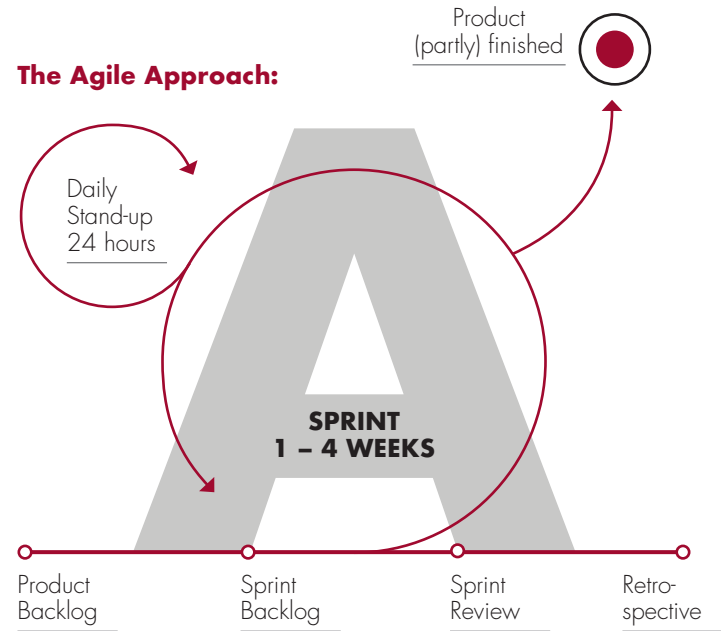
## The V-model:



Systems Requirements Analysis

Systems Architecture

System Design

Software Architecture

Acceptance and Usage

System Integration

Integration Test

Unit Test

## The Agile Approach:



Product (partly) finished

Daily Stand-up 24 hours

**SPRINT 1 – 4 WEEKS**

Product Backlog

Sprint Backlog

Sprint Review

Retro-spective

V-model-based processes have proven to be useful for the development of products for regulated markets when a solid foundation is needed for developing numerous mandatory features and creating supporting documentation. V-model benefits typically include continuous traceability, complete test coverage, complete documentation, etc.

A certain "sluggishness" is often perceived as a disadvantage of this approach, since there is usually a considerable delay between the occurrence of an undesirable event such as a defect or a change in market requirements and the corresponding response. In contrast, agile workflows offer the advantage of flexibility and rapid responsiveness, as a correction can be made within days or in the next sprint. Errors are eliminated more quickly because "thinking through" the faulty module is much faster if the work on this module was done just recently.
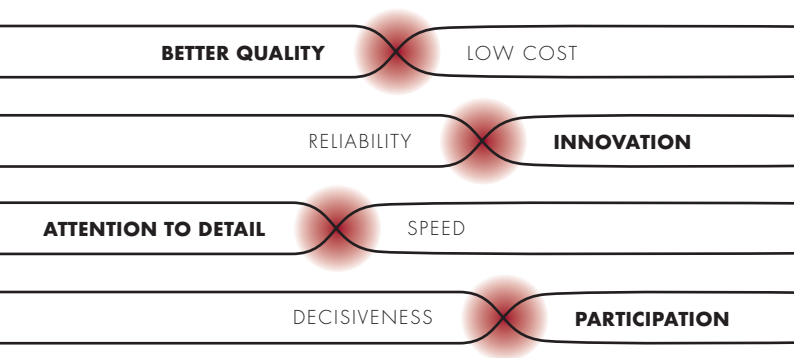
A synthesis of both approaches resolves this conflict. We practice this successfully in our own labs. Within a sprint, all work steps of the V-model are executed as a kind of nano-cycle for a change request. Errors are discovered shortly after implementation, when elimination can be done quickly. At the same time, we can use the advantages of the V-model with regard to documentation and traceability and thus successfully complete certifications and audits. A comparable approach is also already practiced today in many V-model based projects when changes are required shortly before release or delivery.

**The choice between the two approaches is not exclusive EITHER/OR. It is your decision how agile you want to be and we support you to practically implement the synthesis for your projects.**

**Prioritization based on differentiated weighting enables the balancing of conflicting goals.**

Such as maximum achievable freedom from defects vs. shortest possible project duration. Obviously, you can't have both in the same project. More time for QA measures extends time to market, and saving on QA measures leads to more undetected defects.

Typical conflicting goals:

| BETTER QUALITY | LOW COST |
| RELIABILITY | INNOVATION |
| ATTENTION TO DETAIL | SPEED |
| DECISIVENESS | PARTICIPATION |

**One approach to finding a healthy balance in the example scenario above:**

It can be helpful to define an acceptable level of quality that should be achieved at the time of delivery. Start QA measures early and continue them concurrently with design and development. Create the basis for a close integration of the parallel activities between QA and development through suitable tools, integrations and processes.

**Plan your path with sensitivity.**

Disruptive changes to the engineering environment and established processes and methods entail high risks. Projects could be delayed or even fail, and team members may not be prepared to embrace the change. It may sound somewhat paradoxical, but one goal of any change process is to leave as much as possible unchanged. An improvement should be achieved with as little change as possible and, above all, without negative effects in other areas. We help you to achieve this by applying our diverse engineering experience gained over decades.

# You know where you are at.
# You know your priorities.
# You know where you want to go.

It is unlikely that a „one size fits all" approach can improve the individual situation in your environment, even if that sounds tempting and simple at first glance. Improving the complex mesh of tools, processes and individual skills of experts requires a specific and customized approach.

We support and accompany you with workshops, training or coaching sessions, aligned to your demand. Together with you we'll determine type, scope, and timing to meet your specific needs during the change project.
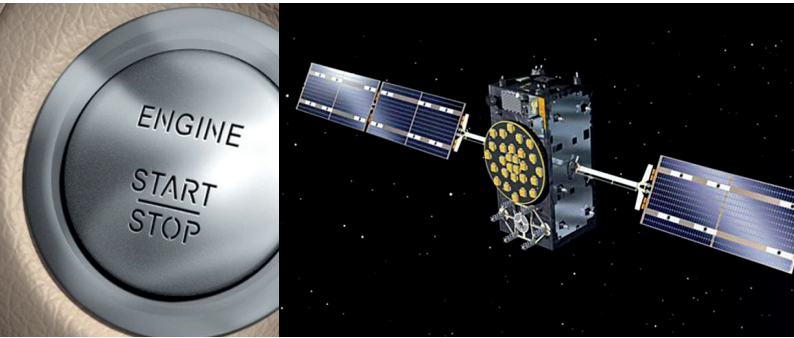
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## Holistic Engineering:
## Holistic change demands holistic expertise.

For 30 years we have been supporting our customers in applying of engineering technologies for development of complex systems and software with a focus on embedded systems, including safety-critical applications. We know that complex systems can be developed efficiently without compromising quality if the context of tools, methods, processes and know-how is aligned.

No matter to what extent you are planning changes, we will work with you to ensure that new elements are seamlessly integrated into your environment. We will be happy to assist you along the entire journey.

**Rest assured**

- **that we have chosen** together with you the solution that responds to your needs and expectations.
- **that we have established** together with you the procedures and processes that you need for successful projects.
- **that we have equipped** your team with all the necessary skills to work productively and efficiently.
- **that you are provided** with a fully functional solution after deployment.

We only suggest tools and methods that we have thoroughly evaluated ourselves or successfully use in our own labs.
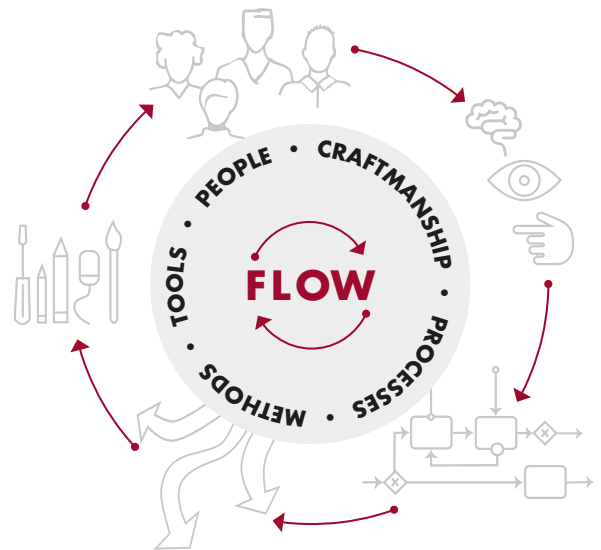
**We have acquired our many years of expertise in numerous successful customer projects. For decades, we have been supporting our customers in the development of embedded and real-time systems, including safety-critical applications, with adequate technologies.**

**Most of our customers are from the automotive, aerospace, defense, medical and railroad engineering sectors.**

Our portfolio at a glance:

**SODIUS WILLERT**

We can assist you at every step of your journey:

Doing so, you'll establish a solid foundation that helps you master the complexity of your demanding engineering projects.

- **Analysis of the initial status, including joint workshops if necessary**
- **Consulting regarding the selection of processes and methods**
- **Advice on the selection of appropriate tools**
- **Evaluation of suitable tools**
- **Sale and delivery of the tools**
- **Configuration and commissioning**
- **Specific adjustments, if needed**
- **Integration into the target environment**
- **Establishing processes and methods with the tools**
- **Coaching and training of staff**
- **Ongoing service and support after commissioning**

| Integration & Workflow | Requirements Engineering | Standards | Embedded Systems Modeling | Quality Assurance | Consulting & Training |
|---|---|---|---|---|---|
| _ Management of versions, variants & configurations<br>_ Task Management<br>_ Collaborative Reviews<br>_ OSLC Connectivity<br>_ Agile<br>_ Scrum<br>_ V-model | _ Visibility<br>_ Collaboration<br>_ Traceability<br>_ Scaleability<br>_ Granularity | _ AUTOSAR<br>_ ASPICE<br>_ ISO 26262<br>_ IEC 61508<br>_ DO 178B<br>_ DIN EN 50155/ IEC 60571 | _ UML/SysML Modeling<br>_ Development Environment<br>_ Simulation & Debugging<br>_ Code Generation<br>_ Keil/ARM Tools | _ Test Management<br>_ Defect Management<br>_ Test Execution | _ Scheduled Trainings<br>_ Methods & Processes<br>_ Coaching<br>_ Workshops |

PORT FOLIO

**Requirements Management/Traceability**
Establish an efficient requirements management process for uninterrupted traceability, increased quality and reduced costs.

**Model Complex Systems**
Reduce error rates and project runtimes thanks to clear graphical representation of functions, actors, interfaces, architectures, and more…

**Engineering Tools Integration**
Unlock development data from the silos of expert tools and create cross-tool transparency, more efficient.

**Safety and Certifications**
Reduce the extra work required for regulatory compliance and certification to IEC 61508, ISO 26262, DO 178B, DoDAF and other standards.workflows, and shorter project timelines.

**AUTOSAR and ASPICE**
Develop AUTOSAR compatible software components and improve your chance of success for the next ASPICE audit.

**Testing and Quality Assurance**
Integrate quality assurance into your design and development process for close integration of quality assurance measures with product creation.

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# ENGINEERING
## FOR COMPLEX SYSTEMS

*Get in touch with us when it comes to complex projects!*

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