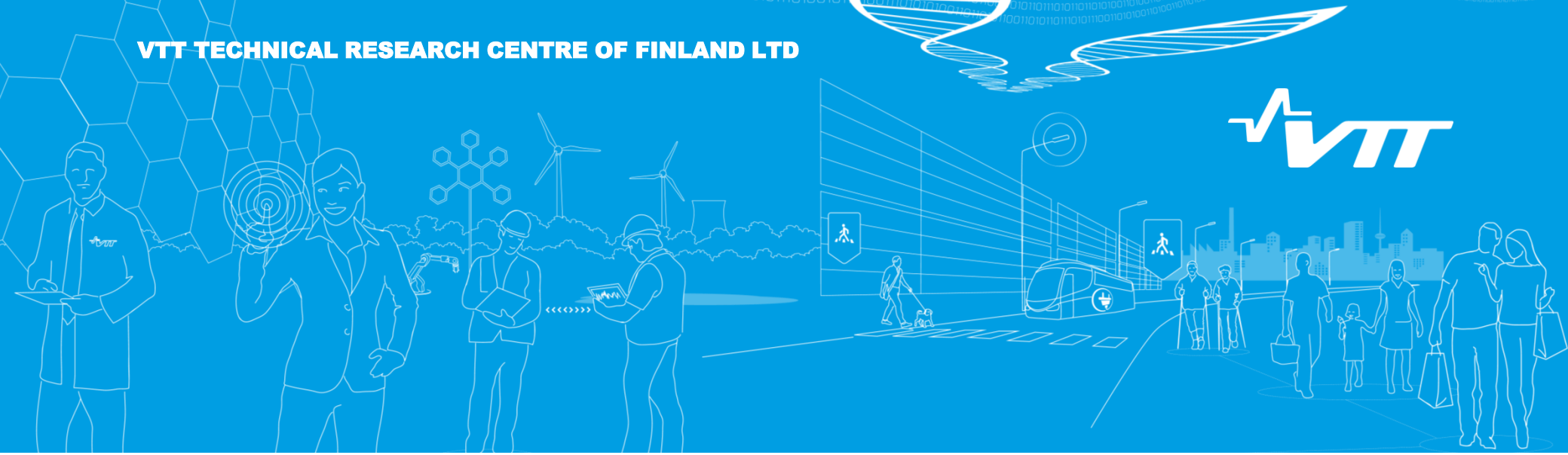

Modeling Factory webinar
Status of the platform
Materials modeling demo

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Technical progress 1

- Python and Matlab integration

Python integration (1st version)

- Done: python integration
  - Most common data types convertible from python to java (integer, list of integers, float, list of floats, string, list of strings)
  - Extendable to less common datatypes (e.g mixed type lists)
  - Done: connector between python and java APIs (C code)
  - With Jython direct integration would be possible but not planned at the moment due to other limitations of Jython (cannot run python modules written in C needed in high performance computing)

Matlab integration (1st version)

- Done: Matlab integration
  - Most common data types convertible from Matlab to java (arrays of double, character, cell array and struct array)
  - Extendable to less common datatypes
  - Done: connector between Matlab and java APIs (c-code), can be replaced in the future by direct link using Matlab's new java API (as jar into Simantics with accompnying scl module)
- License issues need to be taken into account when using Matlab as cloud service

Next steps

- Variable interface in addition to the current plugin
- Then the implementation would be identical to R-integration
- With the variable interface provides data nodes which are utilized by the Simantics platform
- Similar level functionality with R is then possible

Technical progress 2

- Sulca and System Dynamics

Sulca 5: Life Cycle Analysis tool

- New solver finalized (started before Mod Fact)
- Simultaneous users/computation results service (necessary for shared web service)
- Minimized computation time (considerable reduction from the old solutions)
- Some corrections in the mathematical equation handling
- Optimized memory usage for computation of impact analysis
- Linux version for server installations
- Usage of graphic elements of Sulca/Simantics in Modeling Factory (charts, JFreeChart, diagrams, SVG figs)
- Separate Sulca 5 feature for Simantics Desktop installations
- ParaView-Web testing, Modeling Factory integration started

System Dynamics tools

- IDE working and downloadable
- Web publication features under development

Generic Modeling Factory development

- Modelling Factory website: https://modellingfactory.org/
- Simantics Desktop / Simupedia Studio based configurator for simulations
  - generic components for reading simulation input parameters (e.g. textbox, slider, combobox, radio buttons)
  - generic components for presenting simulation results (e.g. linechart, table, text field, XLSX download, binary file download, SVG image, Bitmap image
- supported data formats for input/output: scalar, vector and matrix values
  - decimal, integer, string, boolean, byte arrays, files

Generic Modeling Factory development

- simulation controls:
- -R runner
- -Python runner
- -Todo: Sysdyn runner, Sulca runner
- -Simulation status / error reporting

- Generic web-based application for configuring simulations (work-in-progress) <- At the moment the users need to install a separate workbench IDE

Materials modeling Demo

- Mini ”ICME”: http://test.simupedia.com/wear-rate-estimator/

- Use case: Wear rate prediction in Ultra-precision machining of steel
- Utilizes Modeling Factory R integration features
- Demonstrates how to transform research results into a web app to disseminate the data in a more versatile/useful form for the end user/customer

Process illustration