

VisualPro - Blended Analysis Software

(STPA & CAST, and Others)



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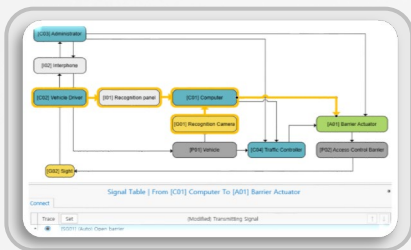
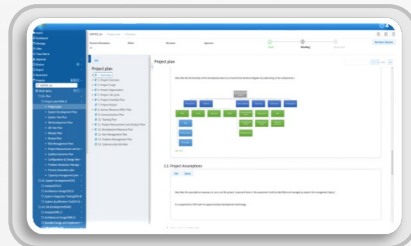
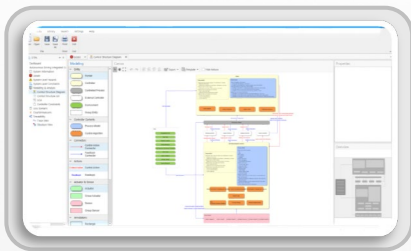


01 Introduction

- VWAY
- VisualPro?



- 1 **VWAY**
- Software development company based in Republic of Korea
 - Software needed for the engineering process



VisualPro

- Safety & Security Analysis Software (Flagship Model: STPA)
- Supports blended analysis with CAST, FMEA, and FTA
- User convenience features

Teamer

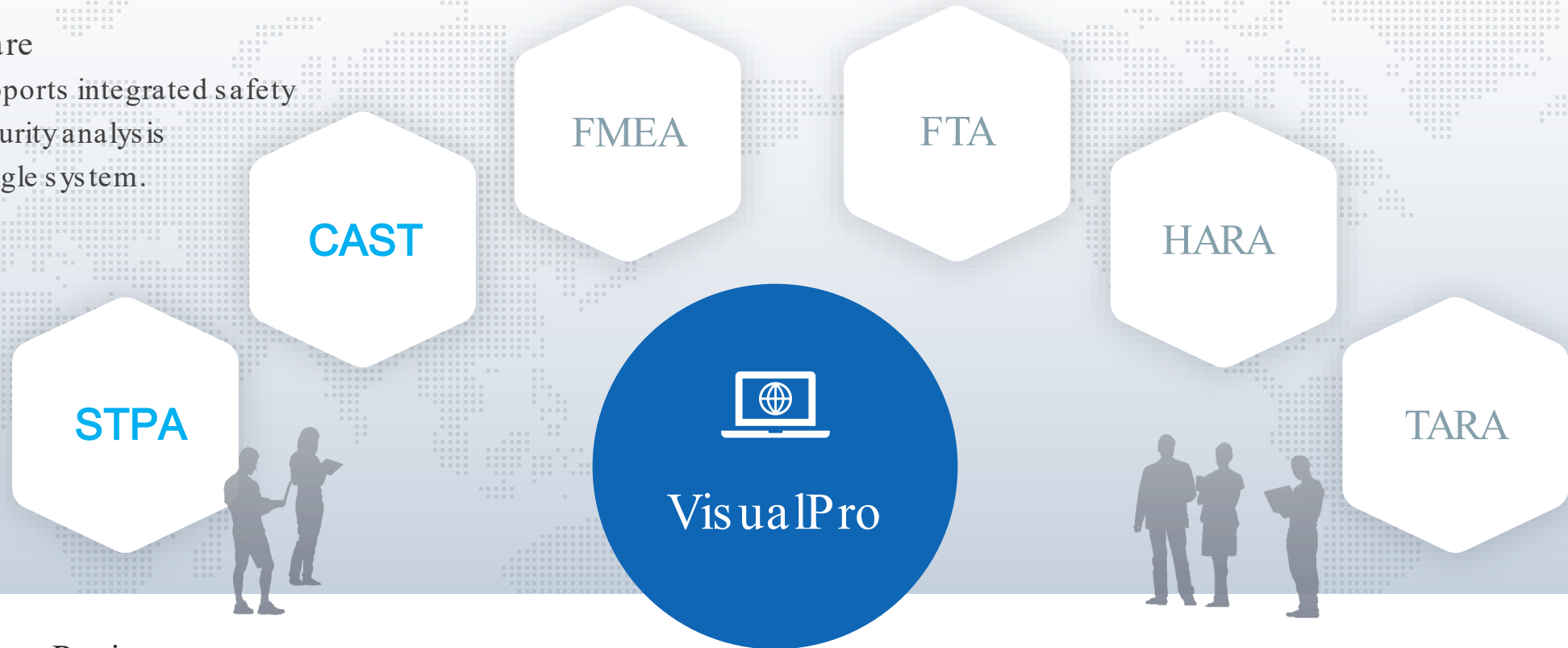
- ALM (Application Lifecycle Management) Software
- Supports maintaining traceability for requirements and outputs
- Project and process management

TRACE IT

- Oriented to support efficient and detailed STPA of complex systems
- Computerization and visualization of signal flow
- Support for Common Cause Failure (CCF) analysis

3 VisualPro?

Software that supports integrated safety and security analysis for a single system.



Customer Regions



EU



KOREA



JAPAN



USA

02 Key Features

- STPA
- CAST

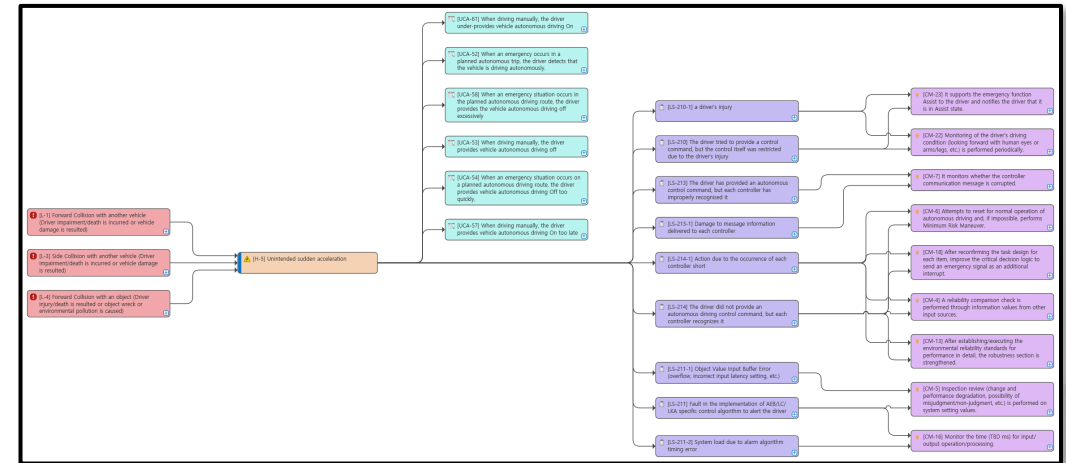
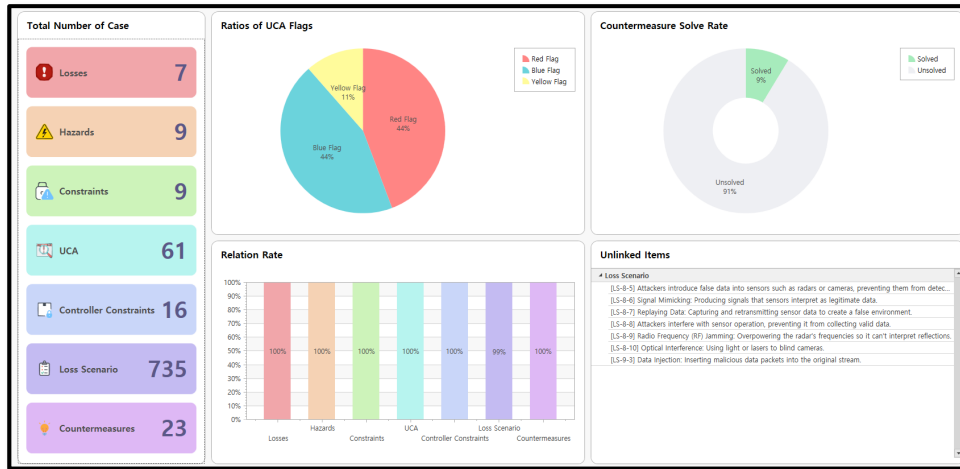


1 Convenience Features (STPA)

- Automatic report generation (Word, PPT, Excel)
- Reusable features for Control Structure, UCA, Loss Scenarios.



2 Traceability and Dashboard (STPA)

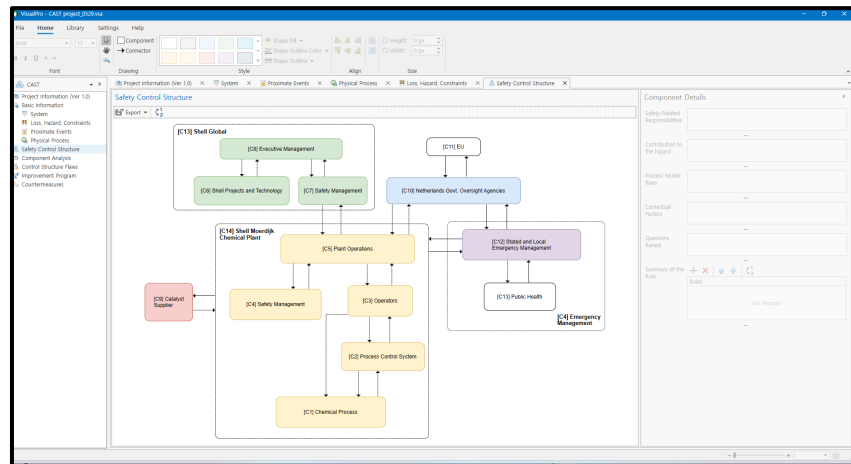


Dashboard of STPA data and analysis status.

Traceability Visualization from Loss to Countermeasures.

3 Support CAST procedures (CAST)

You will soon be able to try the CAST evaluation version.



Drawing Safety Control Structure

Countermeasures	Related Analysis
	[Proximate Events] [E-1] The plant had been shut down for a short, scheduled maintenance stop (called a pit stop) to replace the catalyst pellets and was being restarted
	[Physical Process] [C-2] The plant was not fitted with pressure relief valves that would have prevented a runaway. Those that were installed were not designed for the rapid pressure increases that occurred
	Energy released during the warming of the reactor led to unforeseen chemical reactions between the warming up liquid (ethylbenzene) and the catalyst pellets in the dry zones. As heating took place, the ethylbenzene began to react with one of the catalyst elements (barium chromate), generation heat. The ethylbenzene dissipated this heat in the areas that were sufficiently wetted. In the dry zones, however, this heat did not dissipate due to the lack of ethylbenzene. The result was that in the dry zones, the catalyst pellets heated up considerably, and there was localized development of very hot areas or "hotspots". The hotspots were not automatically detected due to the limited number of temperature sensors in the reactor.
	[Physical Process] [U-2] were sufficiently wetted. In the dry zones, however, this heat did not dissipate due to the lack of ethylbenzene. The result was that in the dry zones, the catalyst pellets heated up considerably, and there was localized development of very hot areas or "hotspots". The hotspots were not automatically detected due to the limited number of temperature sensors in the reactor.
	The design of the entire safety management system should be evaluated and improved. In addition, the integration of the safety management system and the business management system should be carefully examined to ensure that hazard and risk-related information is not being effectively communicated to decision makers by being stated off at inappropriately low levels.
	Better supervision of the highest risk activities is needed, including turnarounds. Regulators need to oversee and ensure that strict procedures are being used for the most dangerous activities and that the safety management system is operating effectively and following its own rules. Operating under limited resources does not preclude doing something effective. It simply requires a more intelligent selection of activities that are performed. There is a need for better evaluation procedures and oversight of safety management system effectiveness. The regulators should rethink system-level supervision to ensure that what they are doing is effective in preventing accidents like the Shell Mexfield explosion.
	Fix the design features contributing to accident. Determine how these flaws got through the design process and improve both the design and the design review processes. Fix the design book so that it is understandable by those who are writing the work instructions and includes all the information needed to safely operate installations of the licensed technology. Fix the work instruction review process by Shell Projects and Technology to ensure the instructions are complete and safe. Review and improve the hazard analysis process used by Shell Projects and Technology.
	[Improvement Program] [CRA-4] - Hazard analysis and risk assessment methods need to be improved.
	[Proximate Events] [E-4] An automatic protection system was triggered that was designed to prevent liquid from entering the exhaust gas system (flare). But preventing the liquids from entering the flare also prevented the gases in the system from being discharged, increasing pressure in the reactor.
	[Proximate Events] [E-7] was later found 800 meters away. The explosion could be heard 20 kilometers away.
	[Physical Process] [C-2] The plant was not fitted with pressure relief valves that would have prevented a runaway. Those that were installed were not designed for the rapid pressure increases that occurred.
	[Physical Process] [PR-4] Provide indicators (alarms) of the existence of hazardous conditions
	[Physical Process] [PR-5] Convert released chemicals into a non-hazardous or less hazardous form

Traceability for countermeasure.

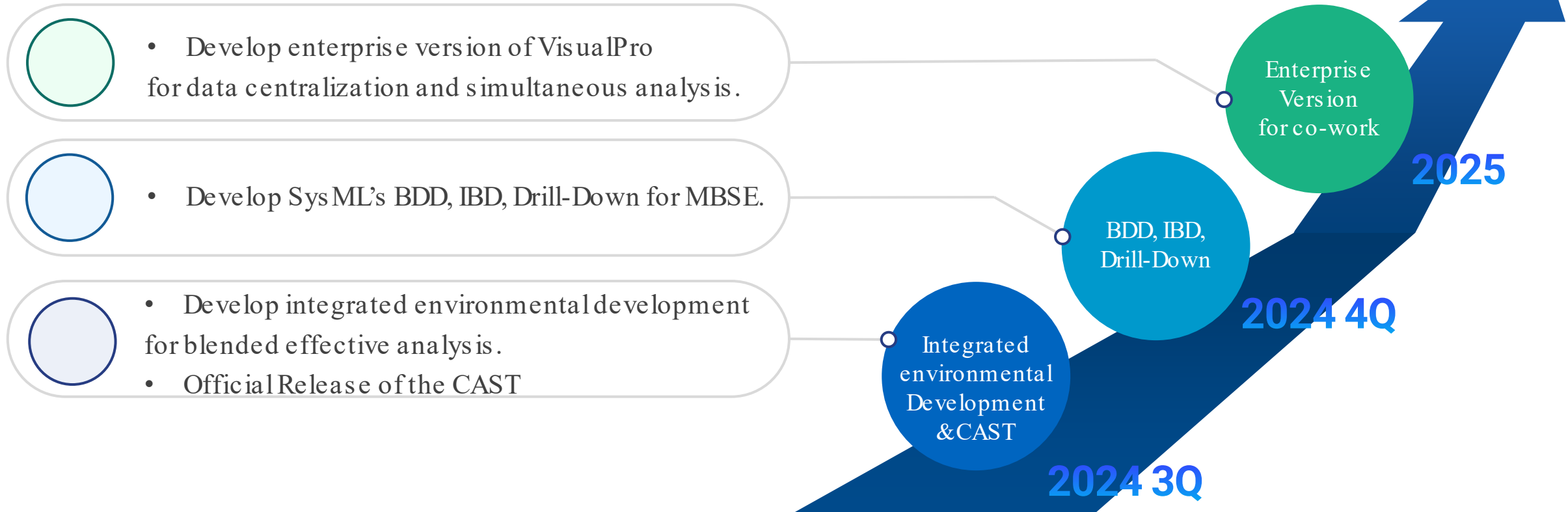
03 Roadmap

- VisualProRoadmap



1 Roadmap

“ Think **safety** first ”





Thank You

