

What Gap Analysis Reveals: Operators' Needs in Industry 4.0 Era

As stated in Transform Erasmus +project, the disconnect between the education system, the productive sector, and emerging technologies limits Europe's capacity to develop value added industrial solutions. This reality underscores the need for a renewed educational approach that integrates advanced technical training and workforce development with a focus on Industry 4.0. And this is precisely one of the main obstacles to face in TRANSFORM, bringing them together;

- education adapted to technological demands.
- Corporate training programs for current employees.

Industry 4.0 has become the major label that identifies heavy, advanced & mass manufacturing today. Still, major manufacturers are struggling to transition from Machine automation into data-driven intelligent systems, which are connected, autonomous, and digitalized. In addition to that, the human role is essential, as many insights recommend that a human-centered system will be the basis for the next industrial revolution.

Horizon 2020 European projects, such as HyperCOG and FlashCOMP, develop advanced technologies by integrating cutting-edge research into ongoing manufacturing processes. And here is where gap analysis is most needed: it helps define what skills operators have with the current process, and what they will be lacking in the near future when the new solution is applied.

The ESTIA-TECH team has had the opportunity to work with different industrial partners in the last decade, including heavy manufacturing companies in HyperCOG, for example Solvay in France, specialized in rare earth treatment, Sidenor in Spain, specialized in steel, Çimsa in Turkey, producing cement, as well as advanced manufacturing in FlashCOMP, mainly composite, with Italian partner Azimut, specialized in making luxury yachts.

The gap analysis reveals the need to learn how to handle smart system notifications, usually in the form of a pop-up window in decision support systems (DSS). The required skills are to be able to understand the message and react correctly to what is going on. While understanding is a mental semantics-based task, reaction is more reliant on technical knowledge and accumulated experience.



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A key factor to successful transition is a well-designed user interface that is easy to read, understand, and interpret. This covers interface design, the selection of colors, the structure of messages: when and where to appear, as well as ergonomic design that reduces eye movement and cognitive charge, and guarantees a positive user experience.

Last but not least, the new system implementation might also move some responsibilities from one job profile to another. The gap analysis helps identify such changes and anticipate organizational adaptations.

A final recommendation is to design a short transition-focused training for operators to ensure that the required skills are obtained. An industrial training should be planned carefully not to interrupt production. It is also recommended to be practical, scenario-based, and to be served in the local language to bridge the language barrier that might block useful communication with some operators.



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