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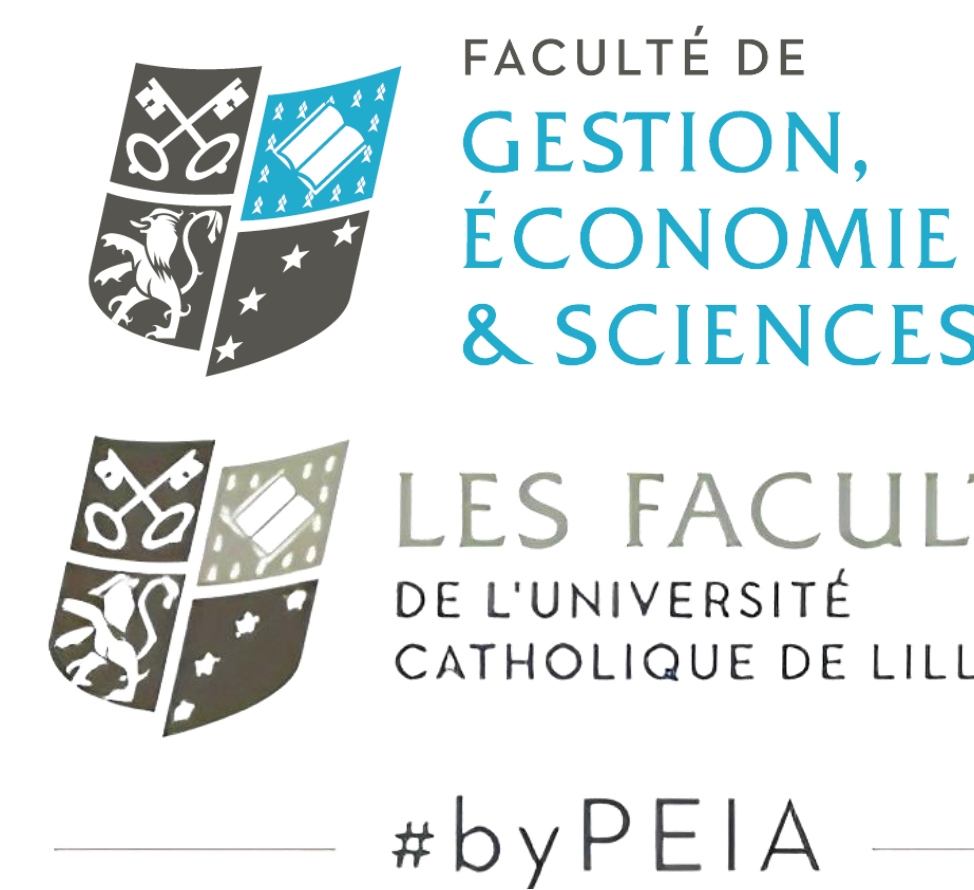
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# Designing Immersive and Adaptive Learning Experiences through Virtual Reality

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## Introduction

- Adaptive learning technology is getting adopted in education at an increasing rate.
- The use of virtual reality (VR) in the training and education fields is similarly on the rise.
- By coupling both technologies new solutions could arise to generate immersive and personalized learning experiences that make learning much more accessible to different learner profiles.

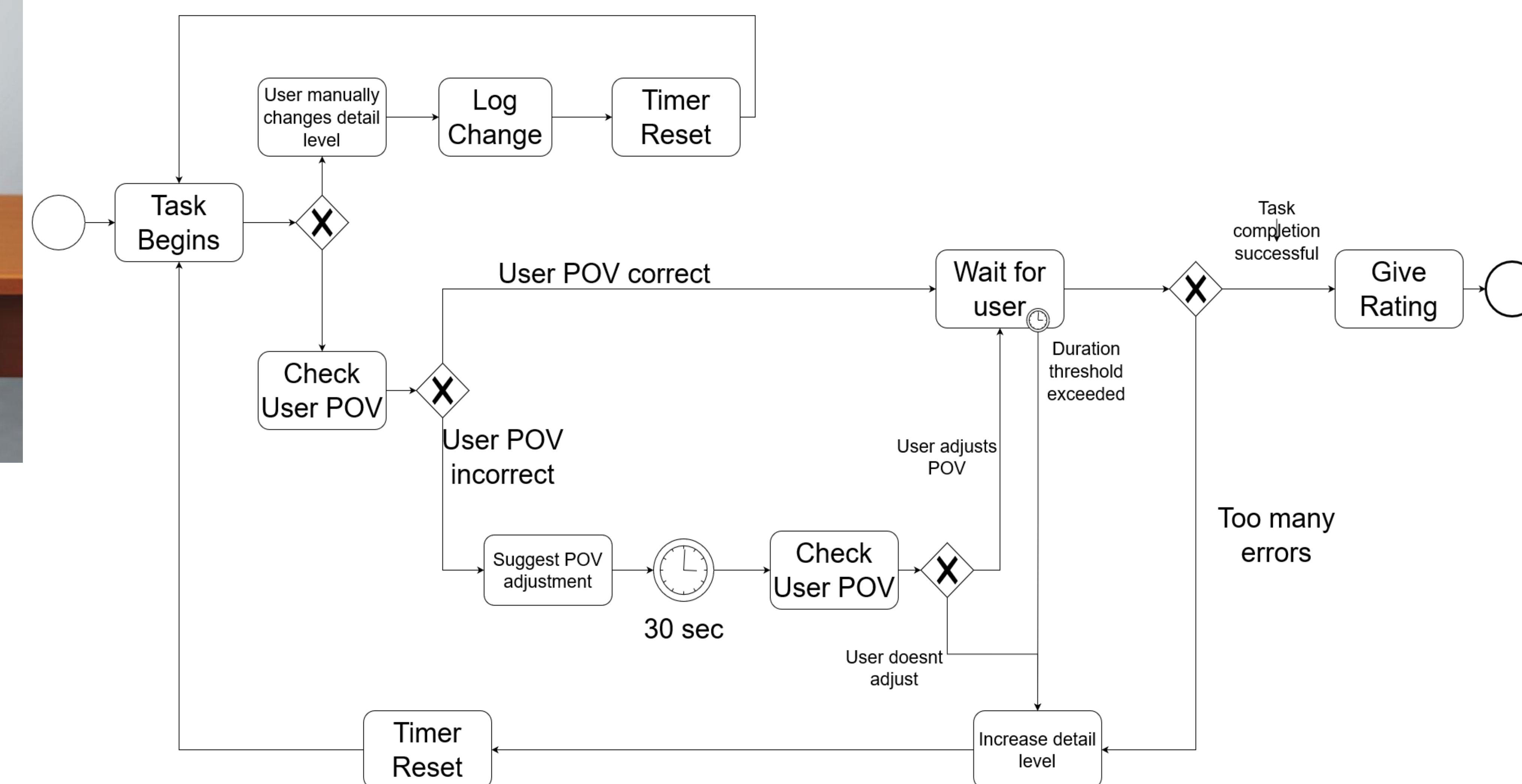
## Adaptive Learning and Virtual Reality

- An adaptive learning system generates a personalized learning experience by customizing a lesson according to every user's needs[1].
- Multiple approaches have been made to couple it with VR systems [2].
- To design effective learning experiences, it's crucial to distinguish between different types of knowledge transfer. Depending on the type of learning required, the components comprising our system need to be adjusted.



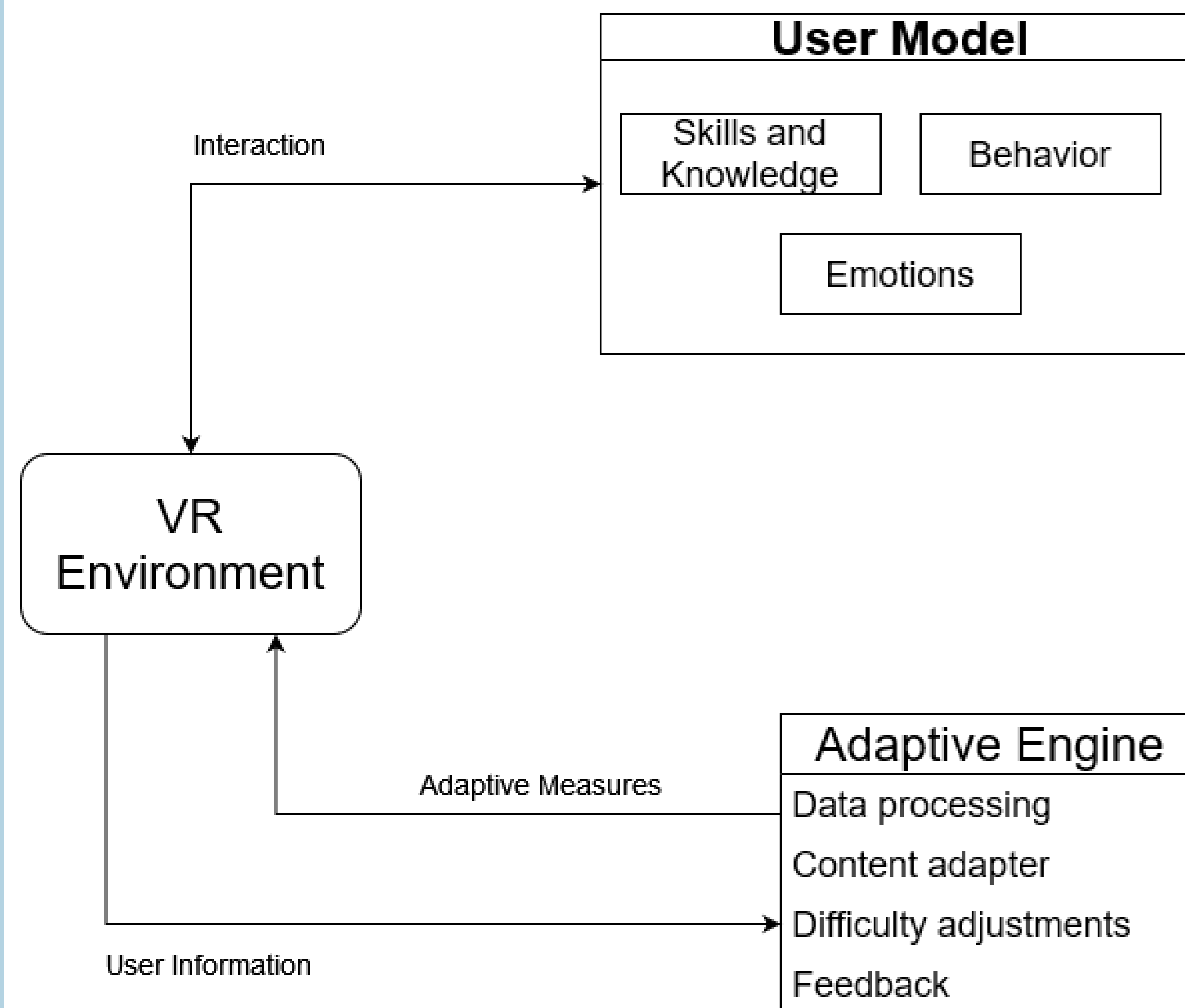
## Modeling the system

BPMN will be used to model the system, as it provides a clear and straightforward method for visualizing the operational logic of the model through process-centric representation. Below is a BPMN model of an adaptive measure: adjusting instruction detail levels.



## Objectives

- Combining the engaging and immersive attributes of VR with the personalization and flexibility inherent in adaptive learning to broaden the accessibility of education.
- Modeling an immersive and adaptive learning system on VR using business process driven representation such as Business Process Model and Notation (BPMN).



Approach proposed by Vega et al. [2].

## Future Plans

- Design and model a generic virtual adaptive learning system.
- Find or implement a standard that would allow us to separate the adaptive system from the VR application.
- Upgrade the simulation by implementing Digital Twin technology, making it real-time.
- Integrating generative AI to further enhance the adaptive system.

## References

- Nuri KA, Sevim N. Adaptive learning systems: Beyond teaching machines. Contemporary Educational Technology. 2013;4(2):108-20.
- Vega, Alieski Véliz, Omar Correa Madrigal, and Vlada Kugurakova. "Approach of immersive adaptive learning for Virtual Reality simulator." Anais do III Workshop on Advanced Virtual Environments and Education. SBC, 2021.