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From Maya and Unreal to Virtual Presence: The Epic Games Lab Case Study

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Learning Objectives

- Learn about the creation of the lab, from concept to the 3D models that contributed to the lab's diverse and eclectic style.
- Learn how to transform concepts into geometry using Maya.
- Learn about best practices workflows with Maya, Datasmith, and Unreal Engine 5, including workflows for building scalable environments.
- Learn about the vision shaping the future of virtual collaborative environments for enterprise-level businesses.

Description

Epic Games and Theia Interactive have partnered to build a sustainable, scalable innovation lab environment streamed in the cloud using Revit software, Maya software, and Unreal Engine software. The Detroit Experimental Lab was designed to be both a collaborative space for meetings, training sessions, and product demos and a testing environment for future technologies. Epic Games' Heiko Wenczel and Nimrod Friedmann of Theia Interactive will lead attendees through the workflows and tools used in creating the virtual lab, highlighting some of the most innovative features of Maya and Unreal Engine 5. The speakers will also detail how the Detroit Experimental Lab's highly interactive design process can serve as a road map for enterprise companies looking to secure their positions in the evolving digital landscape. It will be highly informative for creators and innovation and digital practice managers preparing to enter the metaverse.

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Speakers

Nimrod Friedmann has over 15 years of experience in digital content creation, immersive content, Rendering offline, and real-time solutions, focusing on real-time 3D technologies. Previously a post-production Art Director on commercials and TV branding. After a stint at startup CL3VER, Nimrod joined Autodesk as a Product Manager for 3ds Max of M&E and contributed to improving the understanding of customer requirements concerning product needs and features. Joined Theia Interactive to enhance and guide the creative team, supervising project production, dedicated Unreal plugin development, and market research for future XR projects.

Heiko Wenczel started his career at Mercedes Benz in 2004 with a focus on planning and visualization.
Targeting data models and processes, he continued working in the plant simulation space and joined a team focused on building the next-gen visualization and configuration system for Mercedes' passenger cars.
Heiko joined Mackevision as president and moved to Detroit in 2008 to establish Mackevision Corporation. After that, he was involved in several creative content pipelines for major automotive. After the acquisition by Accenture Interactive, he was focused on building similar workflows for all industry verticals.
In return for innovation and technology, Heiko joined Epic Games to drive the development of next-gen data and visualization platforms in automotive and manufacturing.

Introduction by Nimrod

Theia Overview

We are a team of highly talented artists, designers, and developers. Working with clients all over the world to develop highly compelling interactive experiences and beautiful virtual worlds.

Introduction by Heiko

Epic Overview

Unreal Engine enables game developers and creators across industries to realize next-generation real-time 3D content and experiences with greater freedom, fidelity, and flexibility than ever before.

Learn about the creation of the lab, from concept to the 3D models that contributed to the lab's diverse and eclectic style.

Introduction to the case study

Project Concept

The project challenge

The Detroit Experimental Lab was designed to be both a collaborative space for meetings, training sessions, and product demos and a testing environment for future technologies - What are the components used in the workflow of creating the Lab? We will review the tools and workflow that helped bring the vision into a working project for Epic Games

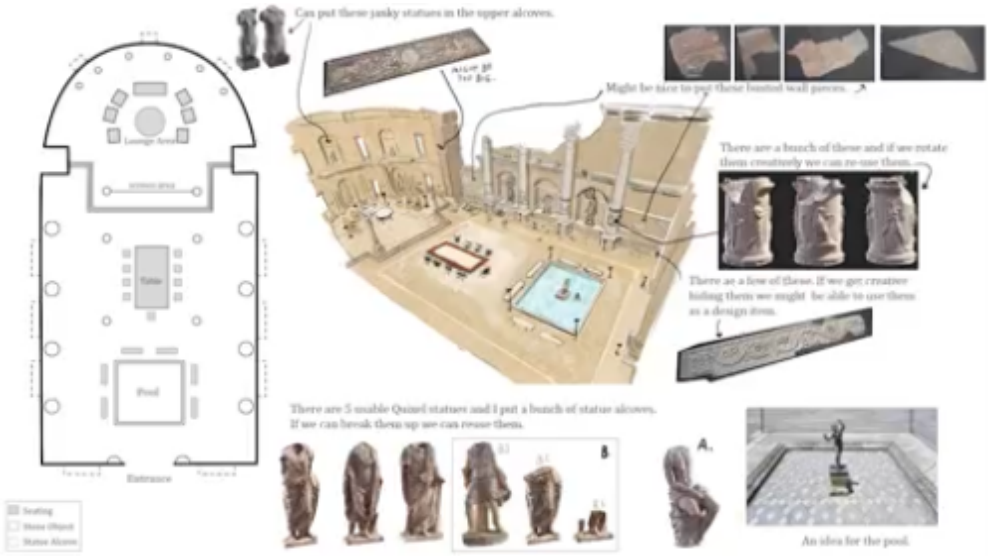
Concept art of the environment and design process

We will review the sketches and thought processes behind creating the different environments.

The process from ideas to concept art

These are the selected environments we will showcase and present the various stages of the design process to the final concept art drawings.

- The Cyber Hub
- The Roman Ruins
- Wetlands
- Conference rooms
- Education Theater



Roman Ruins concept art

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Learn how to transform concepts into geometry using Maya.

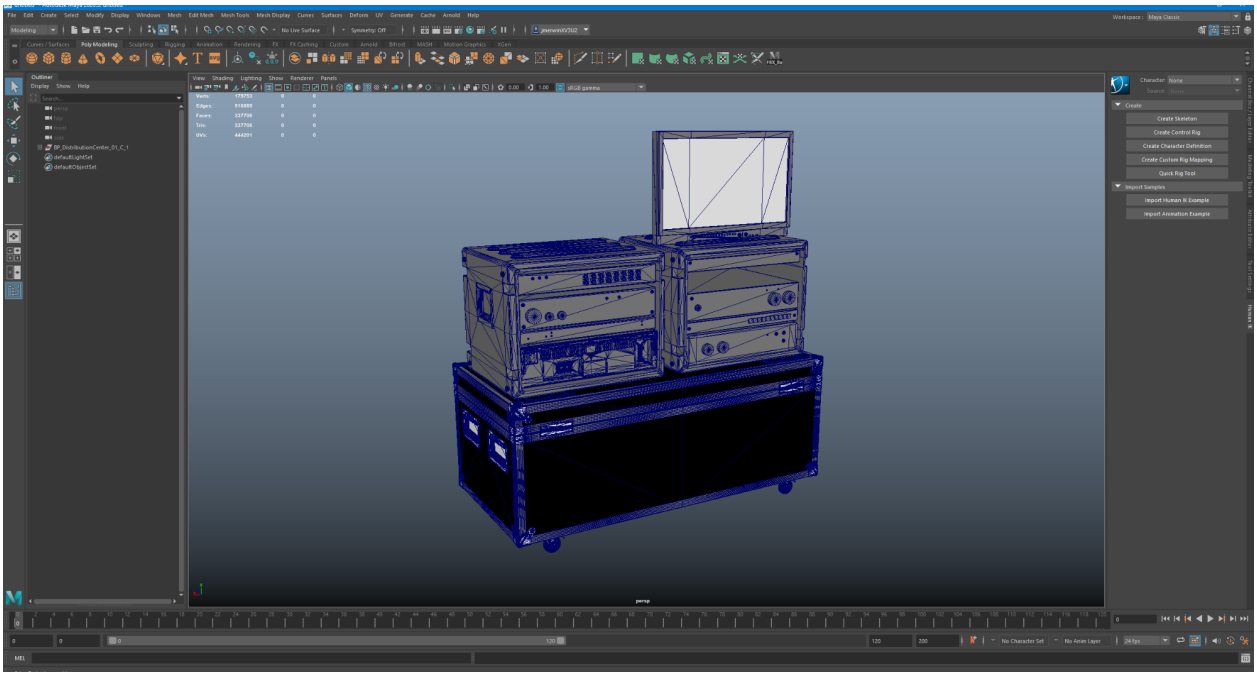
We will review the process using mainly Maya, Substance painter, Revit, and mention - 3ds Max to create and convert the concept into game-ready assets for the Unreal game engine.

Maya - Creating assets from concepts

We will discuss the process of turning sketches into digital assets using Maya.

Why use Maya?

Key features for using Maya as the go-to tool at Theia.



Assets creation in Maya

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Unreal Engine for Real-Time Review

The Real-time advantage

The Unreal Engine editor

Unreal Engine for live design review

When the project is far enough in production and stakeholders can view the project with the final layout, models, materials, and lighting, the great advantage of the Unreal Engine is the ability to present in Real Time this process and make the final tweaks and adjustments, this process is far more efficient and productive then annotation on static images.

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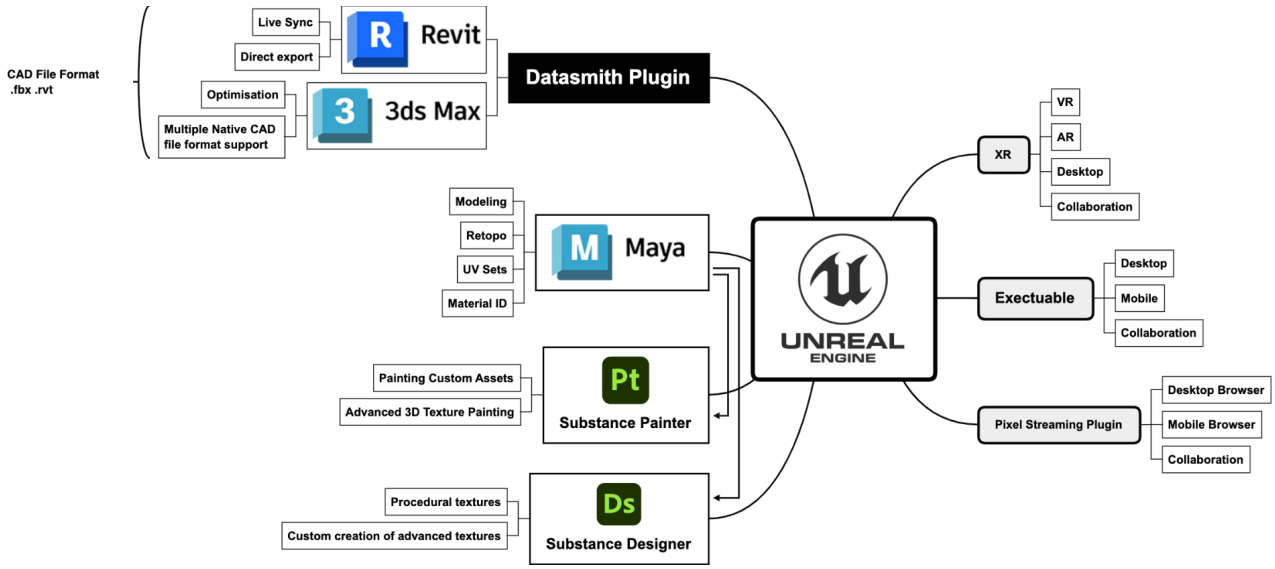
Learn about best practices workflows with Maya and Unreal Engine 5, including workflows for building scalable environments.

Workflow from Maya, Substance to Unreal Engine

The tools set Theia is using for producing content in Unreal Engine.

Workflow high level - Diagram



Workflow diagram

Real-Time Maya assets

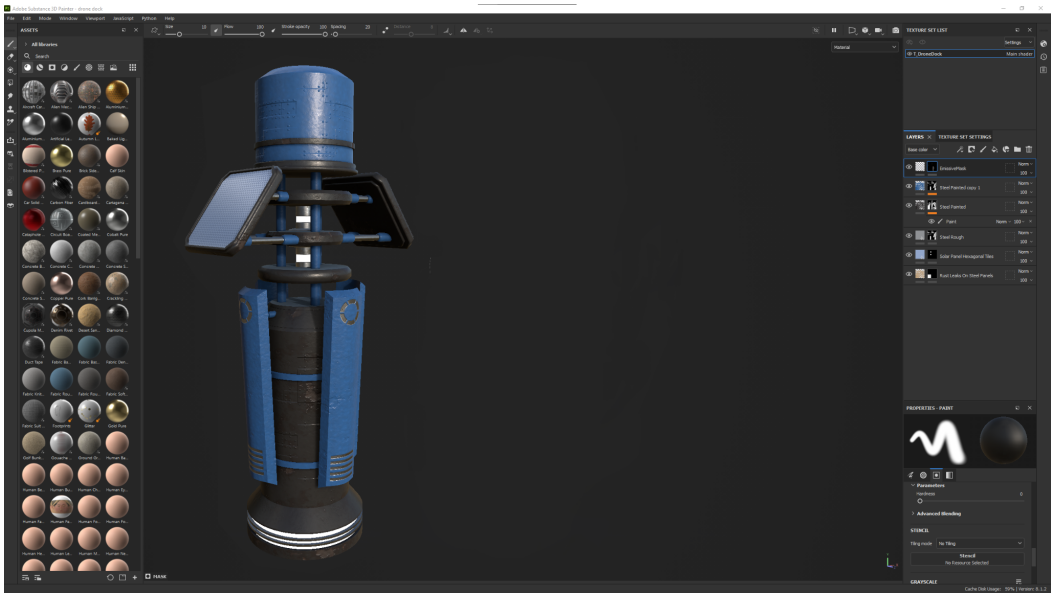
The features are being used to make the 3D assets compatible with a game engine workflow and ready to be textured with Substance Painter.

- Modeling Toolkit
- UV ToolKit
- Remeshing Tools

Maya to Substance

The essential features used in Maya after the modeling phase is complete and prepared for use in Substance Painter.

- Material Slots
- UV sets
- FBX format export



Maya to Substance painter workflow

Substance to Unreal Engine

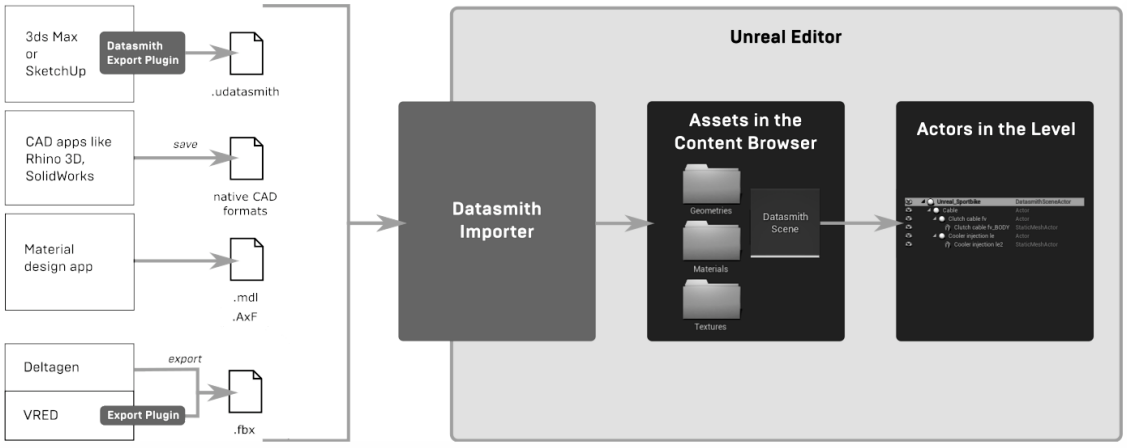
Features used in Maya

- Substance Source Material Library
- Procedural Wear and Effects
- Advanced 3D Texture Painting

Substance painter to Unreal workflow

What is DataSmith?

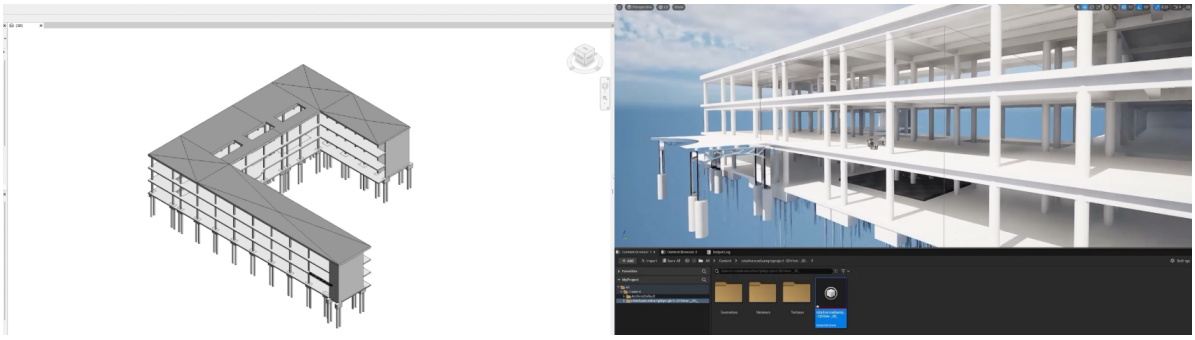
Datasmith is a collection of tools and plugins that brings entire scenes into Unreal Engine.



Revit dataset exported Unreal engine using Datasmith.

Exporting Revit to Unreal Engine using DataSmith

Describes considerations that apply when you use Datasmith to bring scenes from Autodesk Revit into the Unreal Editor. Example of a Revit Dataset exported to Unreal Engine using Datasmith and the(optimal) Revit settings.



Revit dataset exported Unreal engine using Datasmith

LookDev in Unreal Engine 4.27

In the workflow in the Unreal Engine editor getting the assets ready for pixel streaming, we will review the different stages and the advantages of working in Real-time.

- Layout design
- Materials
- Lighting
- Post-processing
- Optimization

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Why Pixel Streaming?

The Lab project is being deployed in Pixel Streaming technology giving access via the web to users, we will discuss the advantages of using pixel streaming in production.

- High-level overview
- Surreal - Virtual platform for virtual environments
- Overview of the Lab

The Epic Lab deployed on the Surreal platform.

Unreal Engine 5

Overview of the benefits of upgrading to the latest and greatest version of Unreal.

- Lumen - Dynamic global illumination and reflections
- Nanite - Create worlds with massive amounts of geometric detail
- World Partition/Data Layer streaming - World Partition system changes how levels are managed and streamed.
- Modular Game Features - streamlines Unreal Engine project structures and dependencies.
- Virtual Shadow Maps - Significantly increase shadow resolution to match highly detailed Nanite geometry

The Lab in Unreal Engine 5

- Visual comparison of Unreal Engine 4 and 5
- The Lab in Unreal Engine 5

The Lab is leveraging Unreal Engine 5.

Learn about the vision shaping the future of virtual collaborative environments for enterprise-level businesses.

Spurred on by the success of the world-building game Fortnight, and the community-building instigated and fostered by Fortnight users, Epic is committed to building an open Metaverse.

Epic Games vision overview

Again, using the popularity of Fortnite as a springboard for their vision of an open metaverse. Sweeney laid out Epic's vision for Fast Company.

"We want to make it possible for any developer to bring their content into *Fortnite* and for any brand to have their presence known in *Fortnite* . . . and to have it grow into an ongoing self-evolving ecosystem.

The Detroit Innovation Lab could be used in the future as a template provided by Epic to allow Enterprise companies to create Metaverse content for their brand.

Eco-System of libraries and content

Through Unreal Engine, Epic Games Store, and Epic Online Services, Epic provides an end-to-end digital ecosystem for developers and creators to build, distribute, and operate games and other content, for everyone from single developers to industries such as film and television, architecture, automotive, manufacturing, and simulation.

Metaverse examples.

The Automotive Metaverse explained

While the Metaverse may currently be the only consideration for some industry segments, for the Automotive industry the Metaverse is being fully utilized to design and sell cars, and train automakers, and mechanics. It is even impacting the way in which cars are being driven. The automotive Metaverse includes everything from visualization of automotive production lines for greater productivity, to virtual training of auto mechanics, to test drives by consumers, to heads-up displays designed to alert drivers to safety hazards, traffic patterns, and internal system alerts.

Project stories and practical market verticals

Extended Reality solutions and software provider disguise hosted their informational webinar Opening the Gateway to the Metaverse inside the Lab. Redesigned as a disguise branded collaborative space, the disguise team, along with guest speakers from Zoan, BYTE/DEPT®, and Epic Games, walked attendees through the challenges of the Metaverse, and the tools, technologies, and infrastructure is designed to address them.

Metaverse examples.

Theia World Building Overview
MetaSpaces - Immersive collaborative spaces and experiences

Additional Resources

1. Datasmith - Unreal Engine - Plugins for exporting complete DCC scenes into Unreal engine
2. Unreal Engine 5.0 Release Notes | Unreal Engine 5.0 Documentation
3. How-epic-games-is-changing-gaming-and-maybe-the-metaverse