VR Skill Bank

Mission

Use VR to train anyone in vital crafts and trades while empowering instructors to teach and preserve the legacy of their knowledge.

Overview

Today, critical crafts and art forms are being lost not just due to technological displacement but a lack of access between those who need to acquire the skills and the masters that can train them. Human society has been built on the passage of this knowledge, from making fire to making jets. Imagine a place where anyone can learn to shape wood on a bandsaw in order to build an Eames lounge chair or create an efficient irrigation system all under the tutelage of an expert with infinite patience. This is not about watching a 360 video. It is about trying, failing and building memories that teach. Once the knowledge is "banked," the use cases can be very diverse.

Key Objective

The primary goal of the VR Skill Bank is to establish a means by which individuals, companies, and governments can take the lead in developing their own interactive courses. Our platform would enable compelling, unique content and make the tools accessible for others to generate more. This differs from existing methods of learning which often have skill acquisition as the core objective and the end result, secondary. It is our belief that both go hand-in-hand and that the best use of VR-based training is to recreate the real processes for making high quality, meaningful deliverables over the completion of throw-away classroom demos. The broad value of the VR Skill Bank represents a sustainable business model that would allow commercialization to supplement grants and donations.

Use Cases

Local Fabrication Training and the Support of the Maker Movement. In the US and Europe, there are many initiatives to help strengthen local production and prototyping. Workshops have opened with free access to heavy machinery yet stay unused because many people are intimidated or lack the skills to even try them. In addition, the maker movement has empowered basic CAD and 3D printing skills yet without a historic understanding of manufacturing and fabrication, many of these entrepreneurs may risk failure in production. The affordance of wisdom over raw facts let the skilled craftsperson design according to the best and most efficient methods available. This also becomes a playground for experimentation without wasting unnecessary resources.

Archiving Disappearing Crafts. Pictures and videos will not preserve the nuanced history that goes into a trade nor will computer aided design answer why things are made the way they are. With every generation, “national treasures” such as forgers of samurai swords or Barsawa bow makers dwindle without others to take up their call. VR can capture not only the person, but the details of how the materials behave under physics so that students can learn as much from failure as success. The difficulty of acquiring the skill will hone a lifetime value in the minds of the apprentices.

Teaching Infrastructure to Developing Communities. From water reclamation to medical training, once the basic system for capture and simulation are devised, these lessons can be taken by almost anyone and adapted to specific projects. The fundamental skills acquired here can be used on future projects, helping to create specialized teams for grassroots product development. With proper feedback technology, the real environment may be used to modify the lessons to account for actual challenges and variables. Critical problems can be shared with other experts who may provide fully realized solutions promptly. VR may become the new “Engineering without Borders.”

System Overview

The system for the VR Skill Bank would include: 1. Digitization of real world assets to be used as tools and virtual raw materials. 2. The creation of an advanced physics engine to simulate interaction with these materials and their engagement with the tools. 3. The capture and projection of instructors linked step by step to each project “recipe”. 4. The evaluation system to provide vital feedback to the students on successes and errors. 5. A versatile peripheral platform to give representative tactile feedback at simulated touch points.

The core elements of the system--tools, materials and instruction can be developed first with one or two set projects in mind. We would try to pursue the skills for building a specifically recognizable piece of furniture as well as perhaps a water reclamation system. This way, our one enterprise may serve vital needs both domestically and abroad.

Budget Considerations

Budget and team structure can be explored further depending on the launch scale, however, we would seek to prove all elements of the core system through their initial use cases described above including the VR Skill Bank app and the specialized peripherals that make use of Vive trackers. The developer tools should be considered from the ground up, as well.

Our core team and advisors have extensive experience in prototyping, manufacturing, arts & crafts, and new product development--all directed at creating a system we would passionately participate in.

Key Value Factors of the Skill Bank:

Representative Simulation. This is the ability to commit trials that provide the 100+ hours of muscle memory and mental habits needed to learn a trade safely in varied environments. The quality of the finished deliverable can be evaluated not just as a right or wrong answer but as a complex “analog” creation just like those expected in the real world. Their achievements would be unique and ownable--something to be proud of at every skill level.

Effectiveness of Instruction. Feedback and interaction separate experience from rote memorization. Another problem of video or online training methods is a loss of context, either by how the scene is framed or a desire to fast-forward because the instructor does not seem real or engaging. By connecting passionate master artisans to the VR medium, students may empathize with their energy and enthusiasm when learning their trade. The net result, along with the “wow factor” of VR, means the lessons will be made to stick.

Practicality. Compared to traditional on-site training, VR has no limits on location or time. It is also a multiplier in terms of how many people may share in the education. An all-in-one training kit could mobilize the instruction in advance of the start of a real project. There are opportunities for performers and passive observers to witness the simulated projects at various stages for buy-in, feedback and community support.

Gaining Government and Enterprise Support. Aside from strong humanitarian use cases, leading businesses may also assist by sponsoring “digital cloning” of their equipment while matching the donations with on-site supplies. This becomes another avenue for brand or cause awareness. This platform could also generate secondary revenue by developing employee orientation and training programs without the need for ineffectual, tedious check-box testing.

Competitiveness with Other VR Applications

One principal problem of the metaverse is the lack of personal, sustainable meaning back to the world and the threat that it will only be used as an escapist haven. Constraints and challenges fuel the spirit of discovery. While VR can also be an asset for people to realize anything imaginable, without substance or stakes, the stories experienced will merit no weight. We can teach first the creation of specific projects--tangible goods that are precious because of their real-life equity. Through the learning process, anyone will acquire not only hard skills but the confidence to go to the shop and apply what they learned. Perhaps one day, they may even become the teacher.

Feasibility

The technologies to accomplish everything in this proposal exists in some form including object and human photogrammetry, physics simulations, and dynamic object tracking. They have been breadboarded by different companies to different degrees, several of whom may be contacted to license their technologies to the endeavor. In addition, the end system will evolve

with the state of the art allowing course fidelity to improve over time. Much of the R&D efforts would be aimed at advancing these features toward a practical application and to the desired quality level. The system architecture as well as the specific IP solutions planned are essential to the success of this project. That resultant IP may have broader VR/AR applications that in turn, could also be licensed.

Conclusion

The reach of what is achievable through VR education is nothing less than the power to shape reality regardless of one's current resources or circumstances. It can help developing communities work together as a team to resolve issues of physical and financial inequality. It can help citizens of industrial nations preserve their versatility while evolving existing skills along novel and productive lines. It is the personal fulfillment of becoming a maker. And it will also give the majority of the human race access to a new construct--a Skill Bank, our legacy of creation for the benefit of all future generations.

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