How to Avoid Common Pitfalls in Reality Capture Projects

Reality capture has been around for a long time, but the tools and techniques surrounding it have changed dramatically. Reality capture refers to taking images of the physical world and using those to recreate it in digital form. Reality capture is a powerful tool, since it allows the design process to happen in context with the existing, surrounding conditions. Offering reality capture services to clients, however, isn’t always straightforward as technical, communication, and marketing issues can create challenges. This white paper will explore why reality capture projects fail and how you can avoid many of the common pitfalls.

Without a doubt, reality capture can be complicated. To start, it isn’t a single technology and reality capture can be accomplished with a number of different technologies, ranging from 3D laser scanning to photogrammetry, ground penetrating radar, aerial LiDAR, mobile LiDAR, and sonar mapping. The best technology to use for reality capture will depend on the nature of the project. Regardless of the project specifics and technology, however, a successful project is one that is profitable. When calculating profitability, it’s important to consider costs that are easily quantified, as well as soft costs – such as if repeat visits were eliminated that would have been required with traditional techniques, or if measurements were more accurate and therefore time was saved and project results were more precise. Criteria for success may be different in different sectors. Non-commercial organizations, like government agencies or educational institutions, may place higher priority on saving time and avoiding expenses.

In addition, there is an adoption curve associated with reality capture. Here are the 3 routes that organizations take with reality capture project needs:

1. Outsource reality capture to outside service providers

2. Rent reality capture hardware and software

3. Conduct reality capture in-house and become a full service provider

Regardless of where an organization is on that adoption curve, reality capture projects can run into obstacles that jeopardize success.

Outsourcing Reality Capture to Service Providers: Common Challenges

Outsourcing reality capture services for a project can be an easy way to reduce the amount of work that your firm needs to take on. What some organizations forget, however, is that the project requirements must be defined clearly upfront in order to guarantee a positive outcome. An essential team skill is writing request for proposals (RFPs) in a clear, detailed, and accurate way. In the absence of a good RFP, the project team may receive massive volumes of data from the outsourcing vendor and not know what to do with it. The unfortunate byproduct is that the team feels that the reality capture information isn’t usable or beneficial and the project struggles along.
Another unintended consequence of outsourcing is that firms end up taking on fewer reality capture projects over time. It’s a vicious cycle, firms who engage in outsourcing typically only accept a few reality capture projects each year due to the expense and the hassle of collaboration. As a result, reality capture never becomes easier for the team. Consequently, over time, firms become less motivated to take on business that requires reality capture services. This is a precarious competitive position to be in. More and more projects are including reality capture requirements and firms that avoid taking on these projects will lose out to competitors.

For firms that outsource reality capture, team education is a proven way to reduce the likelihood of project failures. Here are a few best practices:

- **Start with high level reality capture education.** Projects are rarely successful if teams simply take the reality capture portion and “throw it over the wall” to an outside vendor. When organizations understand the possibilities associated with reality capture, it makes them better consumers of outsourced services.

- **Understand what product is needed to meet the project’s reality capture needs.** As discussed, there are several technologies that can be used to gather and deliver reality capture data. Before drafting an RFP for a reality capture service provider, it’s essential to understand what tools are best suited for the project’s needs.

- **Learn how to clearly specify what level of data quality is required.** Useful information for vendors includes the purpose for which the data will be used, as well as 3D positional accuracies. When RFPs include this level of detail, it increases the likelihood that the data deliverables will be useful.

There are many ways that these types of education can be delivered to teams. An efficient approach is to find a firm that has broad experience with reality capture in many different contexts and with data that has been generated by many different reality capture tools.

**Renting Reality Capture Hardware and Software: Avoiding Obstacles**

Some organizations pick the middle ground between outsourcing and insourcing. They elect to rent reality capture hardware and software when projects arise. One of the benefits is that teams get the latest technologies each time they rent. On the downside, however, team members’ skills may degrade between projects, which lowers the return on time or money invested in training. Unless team members are continually using skills, it’s hard to retain them. In addition, each time a new technology is included in a rental arrangement, there are new skills to be learned and these skills-related challenges can lower the success rate of projects with reality capture components.

Another challenge is that rental equipment isn’t always available when firms need it, which can negatively affect project schedules. Reality capture hardware and software rental equipment must be scheduled in advance. If the necessary resources are already booked, project schedules may need to be moved out to accommodate.

**Questions to Consider When Hiring a Reality Capture Consultant**

After you’ve decided to engage a consultant to help your firm make the most of its reality capture business, you must find the right consultant. Here are a few questions to guide initial conversations:

1. **Do you have experience with the full range of reality capture technologies?** Although your firm may not elect to use every type of reality capture tool, it’s important to work with a consultant who understands them all. Consultants who are only knowledgeable about one particular tool may steer you in that direction, even if it’s not the best fit for your projects.

2. **Have you worked with firms at different stages of the reality capture adoption curve?** This breadth of knowledge is important. Even if you are going to purchase reality capture hardware and software, for example, it’s essential your consultant understands the concerns of firms that outsource since those firms will be your customers!

3. **Can you educate my team about how to clearly specify the data I need for outsourced projects?** Unless you ask reality capture service providers for the right deliverable, you run the risk of project problems. Be sure your consultant is not just going to steer you towards insourcing, if that’s not what you plan to do.

(Continued on next page)
Renting hardware and software certainly offers a path to growth. Once firms begin winning significant numbers of projects with reality capture requirements, however, renting quickly becomes a financial burden for organizations.

Purchasing reality capture hardware and software may be a solution to all of these pitfalls. Renting equipment often seems like a good solution for firms with three to seven projects per year that require reality capture services. Over time, however, renting becomes a dead end because it is inefficient and costly for larger numbers of projects. Here are three best practices for determining whether renting is the right solution for your organization:

- **Evaluate market opportunities.** Identify the types of projects where the firm currently uses reality capture services. Also brainstorm new categories of work that the firm could pursue.

- **Look at renting as a proof of concept for a purchase decision.** Renting hardware and software is a great way to test multiple technologies on dimensions such as range, speed, and office workflows.

- **Develop a business case, based on expected return on investment.** Once you have gathered information about the market potential and which reality capture technology would best meet your needs, you may want to develop a business case to persuade key stakeholders that this purchase decision makes sense. This should include the projected return on investment.

Often firms find that there aren’t enough hours in the day to engage in these strategic planning types of activities. Rather than abandoning them, one option is to hire a consultant to help facilitate discussions and smooth the path for decision-making. This is often a more efficient way of getting up to speed on new types of reality capture projects than having your team engage in hours of research. Also, education on the steps required to build a business case can be applied to other types of investment decisions in the future.

**Conducting Reality Capture In-House: Barriers to Business Development**

When firms invest in reality capture equipment, they can perform data collection for their own clients’ projects, as well as act as a service provider for other firms that need reality capture services. A lack of industry knowledge, however, can be a pitfall when cultivating business in new market segments. As a firm’s reality capture workload grows, the need for collaboration and data management skills also increases. Teams must collaborate both with their own clients, as well as their customers who have outsourced their reality capture needs. In addition, large volumes of data generated through reality capture must be stored and managed effectively.

When firms own reality capture hardware and software, the potential for new projects quickly spirals up. Why not use it on every project, where applicable and profitable? Here are three suggestions that can help remove barriers to reality capture business development:

4. **Do you know how reality capture services can be leveraged in many different industries and for many different applications?** Just as you are an expert at serving your clients and understand their needs, your consultant should be able to educate you about industries you do not already serve. This would include information on how other industry sectors use reality capture and how you could offer services to them.

**Do you have experience with and knowledge of the technical infrastructure needed to efficiently support reality capture services?** As you ramp up your reality capture business, regardless of which stage of adoption you are in, you will deal with growing volumes of data. The best consultants can offer insight into the technical infrastructure – both hardware and software – you may need to assist with data management to operate most efficiently.
Learn how reality capture tools align with different types of deliverables. Firms must understand what types of projects their particular reality capture tools are best suited to support. This knowledge can help employees target particular clients, industries, and projects.

Build an infrastructure to support data management. A well-designed system to support data management is essential as firms grow their reality capture business. However, this infrastructure doesn’t have to be expensive or elaborate.

Learn what can be accomplished with reality capture data. Reality capture data can often be leveraged for multiple purposes, sometimes beyond even what the client envisioned. For example, data gathered on a university campus for a construction project could also be used for an online virtual campus tour. Understanding the broader possibilities can open clients’ eyes to the value of reality capture services as well as present new business opportunities for your firm.

To jumpstart these activities, you may want to get some outside assistance. While a data management infrastructure, for example, is essential for successful reality capture projects, it doesn’t have to be one of your firm’s core competencies. As a result, it can make sense to find experts who can help speed that initiative. Gaining broader insights into the use of reality capture tools in different industry segments, as well, is a good way to build a foundation for business growth.

Conclusion
The success of reality capture projects depends on a combination of knowledge and skills that range from technical expertise to project-specific knowledge and industry understanding. Wherever your firm is on the reality capture adoption curve, IMAGINiT can help your team work more efficiently and avoid the common pitfalls that often lead to the failure of reality capture projects.

If you are outsourcing reality capture to service providers... IMAGINiT’s reality capture experts can help you identify the types of education that will best fit your needs, based on the nature of your firm’s projects and the team’s learning preferences. We offer both classroom training, as well as online learning.

If your firm is renting reality capture hardware and software... IMAGINiT reality capture experts can help facilitate discussions and help identify the range of market opportunities that exist for reality capture services outside your existing customer base. We can also help you evaluate different reality capture technologies and guarantee that you have considered all the relevant factors that feed into a buy vs. rent decision.

If you are considering a purchase of reality capture equipment... IMAGINiT’s unique combination of technical and industry expertise make us an ideal choice for educating your team about what is possible with reality capture. We can also make recommendations about how to bolster your technical infrastructure and turn growth plans into a cost-effective reality.

About IMAGINiT Technologies
IMAGINiT Technologies, a Rand Worldwide Company, is the world’s largest provider of enterprise solutions to the engineering community, including the building, manufacturing, civil and mapping industries. With over 25 years of experience, and 45 offices throughout North America, we provide the expertise, training and support to help companies realize the full power of design technology, maximize ROI and gain competitive advantage.

IMAGINiT is a leading provider of Autodesk software solutions and the largest North American Autodesk Authorized Training Center (ATC) partner. All of our locations are supported by a vast pool of engineering resources focused on developing real-life business solutions for their local clients.