Applied Corporate and Industry Analysis

MGT-410 - Spring 2024

UzuCarto SWOT Analysis

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June 7, 2024

Contents

Glossary and Definitions

- **GIS**: Geographic Information System - A system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. In the context of architecture and urban planning, GIS is used to create detailed maps and 3D models that integrate various types of data layers (like topography, infrastructure, and demographics), aiding in project visualization and decision-making processes.
- **CAD**: Computer-Aided Design - A technology used for the design and documentation of architectural projects, engineering works, and other types of planning. CAD software facilitates the creation of 2D drawings and 3D models, allowing for precise dimensions and easy modifications. In architectural contexts, CAD is essential for developing detailed layouts, structural designs, and visualizations of proposed buildings or renovations.
- **BIM**: Building Information Modeling - A process supported by tools and technologies to generate and manage digital representations of a building's characteristics. BIM integrates design, construction, and maintenance data into one model, enhancing decision-making and efficiency throughout a building's lifecycle. It's vital in architecture for improving collaboration and project management. **Feasibility Studies**: A feasibility study is an assessment of the practicality and potential success of a proposed project or system. In the context of architecture, these studies evaluate various aspects of a project, such as economic, technological, legal, and scheduling considerations, to determine the likelihood of the project's successful completion within given constraints.
- **RFP**: Request for Proposal - A document issued by an organization seeking to gather proposals from potential vendors or service providers. In architecture, RFPs specify project requirements and invite architectural firms to submit designs and plans, initiating competitive bidding for projects.
- **UX**: User Experience - The overall experience a person has when interacting with a product, system, or service, emphasizing ease of use, efficiency, and satisfying interaction. In software, UX design focuses on optimizing user satisfaction and accessibility.
- **AEC**: Architecture, Engineering, and Construction - Refers to the sectors that work together in the construction industry to design, build, and manage buildings and infrastructure projects.
- **Orthophoto**: An orthophoto is an aerial photograph or image geometrically corrected ("orthorectified") so that the scale is uniform: the photo has the same lack of distortion as a map. Orthophotos are useful in architecture and planning as they provide an accurate representation of the earth's surface, enabling precise measurements and planning.

1 Context

1.1 Current Situation

In the contemporary landscape of architectural design, the transition from traditional 2D drafting to 3D modelling represents both a significant opportunity and a notable challenge. Architectural firms are increasingly expected to deliver rapid and detailed feasibility studies that visually articulate the potential impacts of projects. However, the complexities involved in assembling and processing diverse data formats—from GIS layers to CAD models—often extend the lead times for project initiation and inflate costs, particularly for smaller projects or those with tighter deadlines.

The adoption of 3D modelling techniques, while offering a clearer and more interactive representation of architectural designs and their impact on neighborhoods, involves a steep learning curve and integration challenge for firms not accustomed to its complexities. This challenge is exacerbated by the need to combine multiple forms of geospatial data like topographical data, buildings data, vegetation data, road data, orthophoto data, and more, which vary greatly in format and detail level. Consequently, architects spend considerable time just preparing the basic digital geographical (or "geospatial") context for their projects, which is a significant time drain and is usually out of the architects' scope. The existing workflow to build a 3D feasibility study, which we reconstructed from our user interviews, is summarized in figure 1.

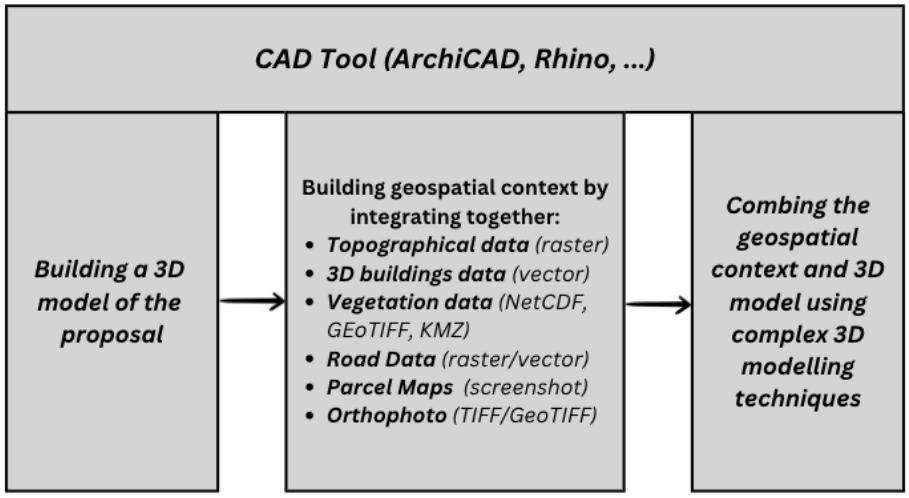

Figure 1: Typical Workflow of a 3D Feasibility Study

Such inefficiencies underline the pain points within the architectural workflow: time-consuming data manipulation, the technical challenge of integrating disparate data types, and the pressure to deliver high-quality 3D visualizations that can decisively influence client decisions. Today, despite the obvious advantages of delivering feasibility studies in 3D, there is wide variety in actual usage of 3D within firms, ranging from 20% (Tom Doan, Swissroc) to 80% (Miguel Bermudez, RDR), going to almost everyone (Simon Bovigny, Doutaz). According to Thomas Lepoutre from Arcadie (where about 50% of architects use 3D modelling), the reason it is not 100% everywhere is mainly due to "a high barrier of entry for architects, and the fact that it takes too much time".

1.2 Uzufly and UzuCarto

UzuFly is an EPFL spin-off which was founded in 2020 by Romain Kirchhoff (one of the MTE mentors and MTE alumn). A few years ago, the development of 3D modeling (or "photomesh") from drone images was still very limited, and focused on the acquisition of images of buildings of heritage interest. Romain then decided to create Uzufly, in order to unlock the potential of 3D modeling in the urban planning and construction industry in general.

Their efforts so far have mostly been toward developing the "UzuVerse" platform, which through their innovation has enabled them to map entire cities in 3D (thus creating "digital twins") at a resolution of 2cm! (See figure 6) They have also been providing some services to communes, such as developing 3D infographics using their data. Along the way, they noticed that, while open source 3D data was readily available, most architects didn't actually use it. They wondered if architects would start doing more 3D modelling if Uzufly provided an easy to use platform where all this 3D data was pre-processed and architects simply had to drag and drop their projects into the platform to integrate it into a geospatial context.

Figure 2: Uzuverse vs Google Maps

Thus was born UzuCarto, a platform which does exactly that: pre-process the open access data provided by the cantons and the confederation, in a way specifically tailored to architect workflows, and give them the ability to drag and drop their projects into this 3D model. This platform aims to streamline the workflow of architects trying to build a realistic geospatial context for their feasibility studies or RFPs (see "Glossary and Definitions"), saving them a lot of time, and increase the quality by enriching the data with specialized GIS tools. A simplified feasibility study workflow integrating UzuCarto can be seen in figure 5.

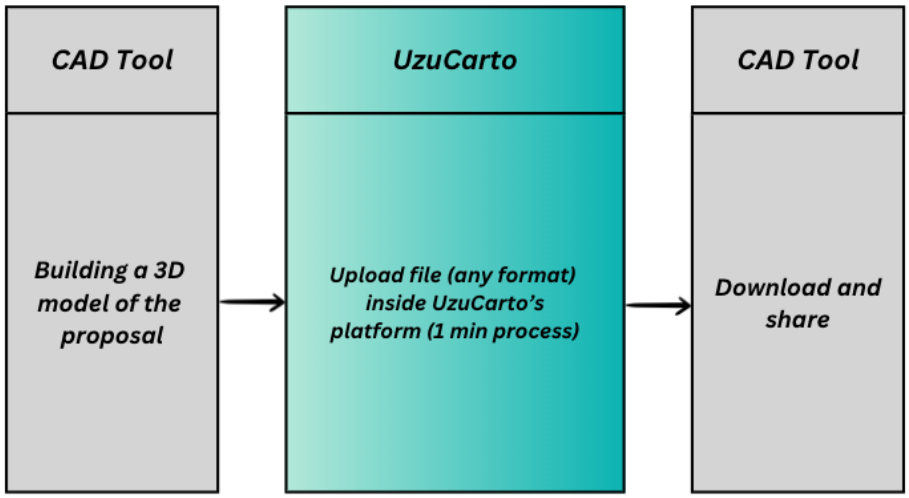

Figure 3: Typical workflow when integrating UzuCarto

It is worth noting that UzuCarto is currently not the main focus of Uzufly, who is still primarily working on their "digital twin" product UzuVerse. Indeed, only 1 out of the 7 full time employees is currently working on it. The purpose of UzuCarto was initially simply to serve as an "onramping product" to Uzufly's future, "main" products, by lowering the aforementioned barrier to entry to using 3D models. However, when they started talking to architects about the product they found a lot of enthusiasm, and found customers willing to pay for this kind of platform. Thus, UzuCarto has since become a project of its own and will likely be Uzufly's first "product".

1.3 Competitive environment and existing workflow

The competition within the niche UzuCarto occupies can be broadly categorized into several groups, which are detailed below.

- **Direct Competition**: LUUCY, Amenti
- **Existing CAD tools**: Rhino, SketchUp, ArchiCAD, Revit
- **"Civil Engineering Competition"**: ArcGIS and CityEngine from Esri, InfraWorks from Autodesk
- **Open Source Competition**: Swisstopo, Conférence des services cantonaux de la Géoinformation et du Cadastre (KGK-CGC), several cantonal public organisations (SITG (Geneva), SITN (Neuchatel), Geoportal Basel-Stadt, ...)

Let's break down each group and understand their positioning and degree of competition with UzuCarto, as this will give us important context before entering into the actual SWOT analysis.

There are currently two startups working in a similar space: Amenti and Luucy. Amenti are a Zurich based startup that has a very similar product as Uzucarto, but they do not have as many formats available, and the data they have is less rich, which makes it a less interesting option from a feasibility study standpoint. Luucy also have a similar product specifically tailored to feasibility studies but it is part of a larger licensing deal which also includes other products, which might not be suitable for a lot of clients. The actual data, like Amenti, is also less detailed and less rich. While they operate in a similar space, UzuCarto is in a strong position because of the strong expertise of their team, especially in

handling complex GIS data. This means that they have been able to process the publicly available data better than their competition for now, giving them a slight edge in this regard.

Existing CAD tools are indirect competition to Uzucarto, and the option that most architects currently use (however inefficient it is). Their main prupose is indeed not to build geospatial context, but instead to develop the 3D models of the architects' projects (a building, for example). If tasked with building a 3D context for their project, they often mentioned during our user interviews that the fastest way today was to manually "draw" geospatial data (like parcel maps), using screenshots, and assumptions (constant terrain, flat roofs, etc). This obviously led to lower quality outputs, which was inevitable for some architects, and imprecision, which is why they needed to call a surveyor later on in the process. This process still took at least a couple hours of slow and repetitive work (Tom Doan, Swissroc), and was rendered obsolete a couple weeks later. Some others used open access data and merged the different formats themselves, but this process usually took anywhere from 3-4 hours(Francois Otten, Kunk de Morsier) to a full day or more (Valentin Popescu, Alef Architectures) depending on the level of detail you want (which is always inferior to what Uzucarto can offer), and the size of the project.

The civil engineering solutions like Esri's and Autodesk's products are large scale products from very well-funded companies, that also integrate CAD data with GIS data. However, these platforms are very much geared toward urban-scale projects rather than building-scale like what architects focus on. They are not used by architects due their cost and complexity and were not mentioned once in our 13 user interviews. Thus, we will not consider them further, although they are worth mentioning to note that the civil engineering space is already very developed, and that the opportunity with un-established competition mostly lies in the architectural sector.

Open Access data and open source platforms are probably the most difficult to assess and most threatening to UzuCarto and UzuFly. Several cantons provide their own 3D data freely to the public (Geneva, Basel, Zurich and Neuchatel), to varying levels of success, but others (Vaud, Valais, Fribourg, etc) have nothing. This data is also rarely integrated together. At National scale there is the Swisstopo dataset: SwissBuildings, SwissAlti3D (for topographical data), SwissTLM3D (for roads, etc), parcel maps, etc. However, nothing is integrated at national scale and users must go through the complex process mentioned in the introduction to end up with a working geospatial context.

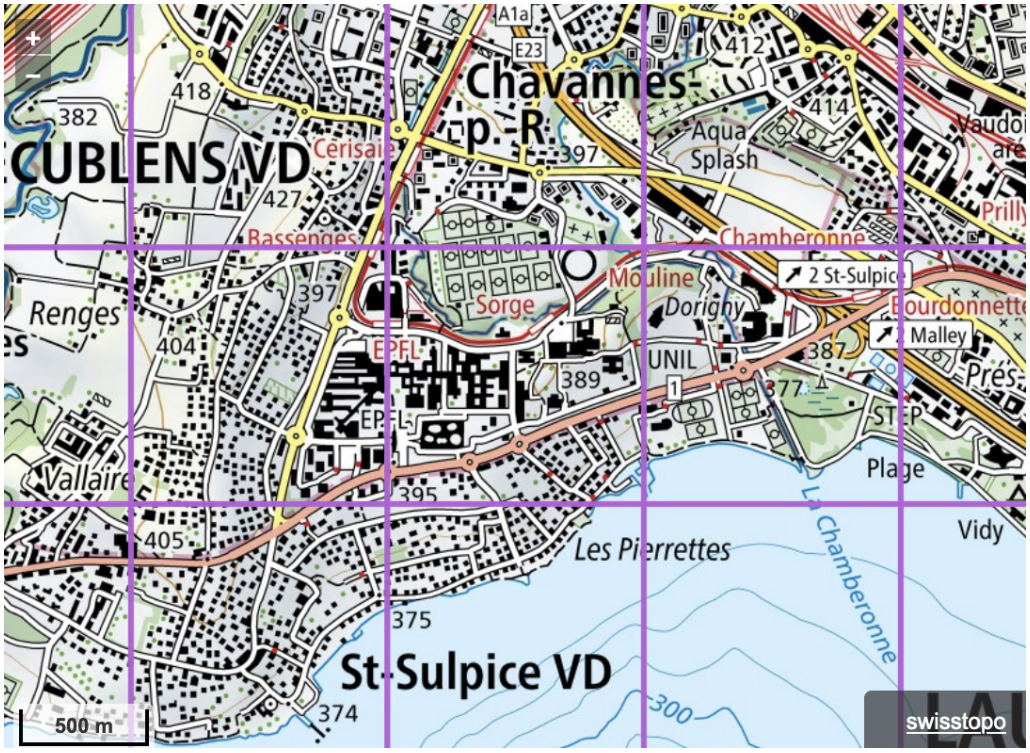

Figure 4: Swisstopo's topographical dataset, SwissAlti3D (Swisstopo, 2024)

There are 2 open source actors that are particularly interesting to look out for in this category: the SITG (Geneva) already gives open access to fully working 3D models which are updated every 3 years, and is very successful with local architects. This makes UzuCarto almost irrelevant in Geneva as they will trust data collected by their canton more than national scale data which is less precise. While other cantons are far behind, this is a trend that UzuCarto needs to watch out for. Secondly is the KGK-CGC ("Conférence des services cantonaux de la Géoinformation et du Cadastre"), which is currently working on a federal 3D open access dataset (similar in objective to the SITG). This association of cantons are working together to democratize the use of 3D data, notably by making high quality data freely available in all cantons, but it is worth noting that they do not plan on developing products tailored to certain niches (like for architects, urbanists, etc). The main risk for UzuCarto is that architects prefer using open access 3D data, even if it means doing some geoprocessing on their own, over a paid "plug and play" solution like UzuCarto, which could save them some time and lead to more consistent results. These public datasets are estimated to be finished anywhere from 2 to 4 years from now, which gives UzuCarto time to discover and tailor itself to the market's needs, to be able to stay ahead of the curve. Some more detail on this point can be found in sections 2.3, 2.4.4, and 3.4.

Assessing what these competitors currently offer, UzuCarto needs to distinguish itself by providing an unmatched ease of use, rapid data integration capabilities, and specialized tools that directly address the needs of Swiss architects. This differentiation is crucial, particularly as the lines between architectural design and geospatial planning continue to blur with advancements in digital technologies. It's important to note that SITG is the only true "success story" so far with democratizing use of 3D data with the architects. Neuchatel canton, Luucy, and Amenti are having trouble finding product market fit. From the feedback and conversations with them (Romain spoke with Luucy and Neuchatel canton), it seems that this is due to a gap between what Swisstopo offers and the architects'

needs, which can be filled with some extra "GIS work", which at the moment only Uzufly (and SITG) has done.

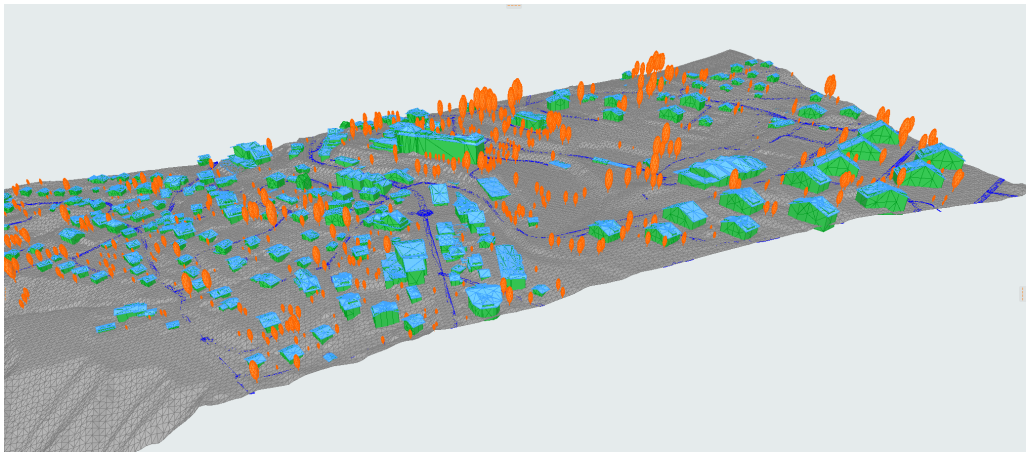

Figure 5: A screenshot from UzuCarto

1.4 Analysis Scope and Objectives

As UzuCarto positions itself within the architectural software space, this analysis aims to scrutinize its strategic standing through a SWOT analysis, informed by a series of user interviews and expert consultations. Through an initial discussion with business development expert Albéric Gros, currently working at L.E.S.S., whose insights on conducting user interviews have been instrumental, we designed these user interviews to have a better understanding of the specific user workflows, drawing a landscape of potential users and understanding their needs, and conduct user experience (UX) tests. More detail about our approach can be found in appendix B. In the context of this analysis we will be drawing the insights of 13 user interviews, including 8 during the Spring 2024 semester, in addition to the initial discussion with Alberic. The companies we spoke to include: ABA, Alp'Architecture, Arcadie, RDR, Swissroc, Doutaz, Urbaplan, DeRham. Romain Kirchhoff (mentor and Uzufly founder) has in addition spoken to Neuchatel Canton (SITN), Luucy (competitor), Ralf Weineck (Art.space), Alef Architectures, and Kunik de Morsier.

This SWOT analysis is confined to evaluating UzuCarto alone, excluding broader assessments of Uzufly's internal organizational strategies, or UzuVerse (although it will consider possible expansions that can leverage UzuVerse in the recommendations and conclusion). It mostly focuses on the competition and workflows directly referenced by users, thereby aligning with real-world, Swiss-focused market perceptions and needs. The primary objectives of this analytical exercise are as follows:

- **Strategic Overview**: To present a clear depiction of UzuCarto's strengths, weaknesses, opportunities, and threats, contributing to the strategic planning and future roadmap of the product.
- **Product Validation**: To confirm UzuCarto's value proposition through direct user feedback, assessing its effectiveness in enhancing the efficiency and quality of architectural feasibility studies.
- **Market Adaptation**: To inform potential adjustments in UzuCarto's pricing model and market approach based on the competitive landscape and user expectations.

2 SWOT Analysis

2.1 Strengths

2.1.1 User Experience

UzuCarto has garnered overwhelmingly positive feedback for its user experience in initial tests and real-world usage. Users praise its intuitive design and ease of use, which significantly lower the barrier to entry for 3D modeling in feasibility studies. The platform's ability to integrate seamlessly with almost any format also added to the UX, such that the user can very quickly load his or her model into the platform despite never having interacted with it before and using different input software (Some users load from SketchUp, others from ArchiCAD, Rhino or Revit).

2.1.2 Successfully Simplifies A Complex and Time-Consuming Process

UzuCarto addresses a critical gap in the architectural design process by significantly reducing the time required to prepare and integrate geospatial and architectural data. As mentioned in earlier sections, the process of manually integrating the data from the different sources takes anywhere from 3 hours to a full day, with a lot of repetitive, burdensome and boring work. If they need a more realistic context, and find themselves integrating the open source data, this is both out of scope of their usual jobs and leads to lower quality results and more work. Some (Severine Routhier, Alp'Architecture) mentioned that they directly resort to hiring a surveyor to create the context for their feasibility studies, but due to the prohibitive price, this is usually unfeasible unless the company is certain of acquiring a project. For Alp'Architecture, therefore, this significantly impacts the kind of projects they can spend time on, especially as a small practice with only 5 full time employees. Most projects in Switzerland function with the RFP system (see "Glossary and Definitions") which generally makes the approach of directly calling a surveoyer quite rare.

The ease of use and ready-made data processing UzuCarto offers also reduces human errors, and increase quality. It helps avoid the manual work of drawing the roads, buildings, and parcel delimitations from screenshots that some architects mentioned. It also helps avoid crude assumptions like flat or constant terrain, and having no or random vegetation data. These methods also make estimating volumes/surfaces a lot more uncertain. Uzucarto is a clear value add to these architects (who usually were the most technically savvy at their firm with lots of 3D modelling knowledge!), and can possibly enable the many architects who never even attempted this and were simply working with 2D models.

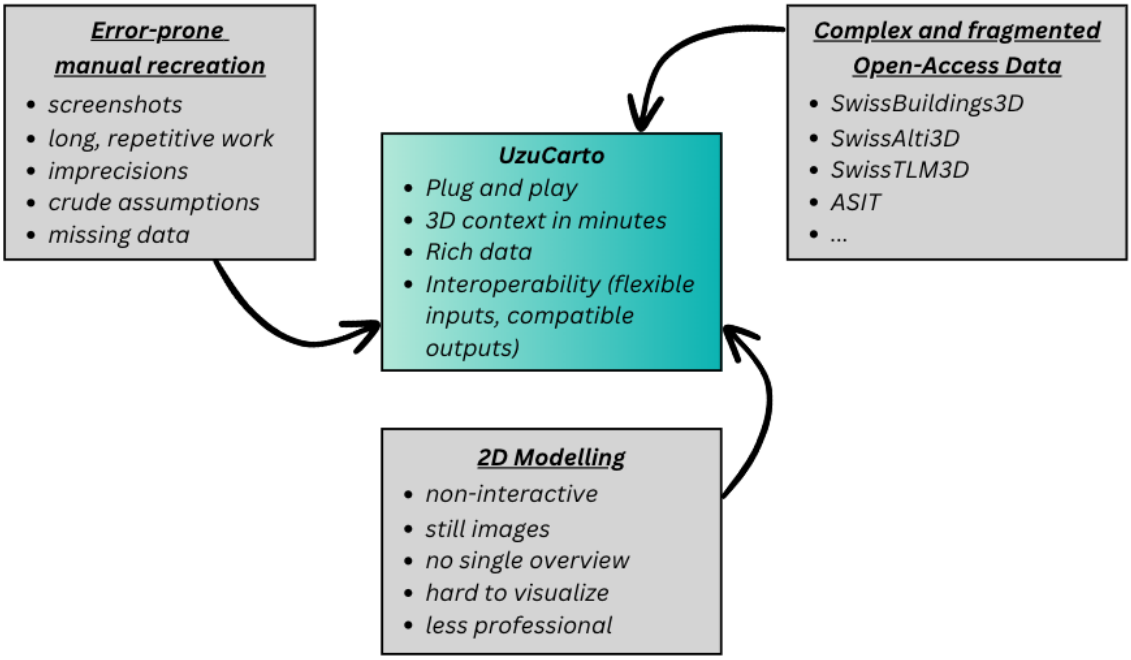

Figure 6: All existing workflows are improved by using UzuCarto

2.1.3 Clear value proposition for users

Some of the most promising feedback revolved around how clear the value Uzucarto brought was to users. Thomas Lepoutre, from Arcadie, has been using the platform since November as a beta user and has since used it for almost all of his projects, despite using a beta version with half the quality of the current version. He mentioned that it has "enormous value to differentiate yourself to communes" when participating in RFPs (see "Glossary and Definitions"), since most architecture firms will use 2D models, and if they use 3D it is generally bad, as mentioned earlier.

Thomas mentioned that using UzuCarto was "extremely valuable to convince clients, very useful to understand the implementation of the project, and that it allowed much more powerful storytelling around the project". He also said that he frequently used the platform to show works-in-progress, just as an internal communication tool, and to clients to show intermediate progress (due to how simple and quick the platform is). This overwhelmingly positive feedback clearly shows that the platform is solving an important problem for these architects, which was to be able to share and communicate compelling visualizations of their projects easily and quickly. While more validation from more beta users is still needed (as Thomas is the only one to have tested the platform this extensively), it is extremely promising feedback that is very encouraging.

2.1.4 User Engagement and interest

Almost all of the architects we spoke with showed immediate and strong interest in the product. Speaking with them about potential pricing, they were generally very receptive and open to the discussion, with one architect even suggesting that Uzucarto could save them up to 45k CHF per year! The near-totality of architects with which we mentioned the 150CHF per tile (square parcel of terrain) price point said it was "very reasonable" (Alp'Architecture, who were initially reticent), and that they would "take this license in a heartbeat" (Swissroc), even though the proposed pricing was almost 4x higher than Amenti! More detail and insights about pricing can be found in Appendix A

In addition, as mentioned in section 2.1.3, Thomas Lepoutre from Arcadie, who had access to the platform for a couple months from an earlier user interview, had used it for over a dozen projects in the couple months between the interviews! He frequently mentioned how much he enjoyed using the platform and the value it brought him. Several people with which we floated the idea of being part of the "user testing group" were immediately very interested, including some of the biggest architecture companies in Romandie.

2.1.5 Operating Costs

UzuCarto is also strong from a financial standpoint because it has very low operating costs, which are limited to the cloud server requests (AWS, aboout 200CHF per month), licensing costs for raw GIS data (FME license, 3k per year and 10k initial cost), and the salary of one software developer. Thus, assuming the median Swiss software engineer salary of 118k CHF per year (Glassdoor, 2024), the total yearly expenses are about 125k, which fall to nearly nothing when the product does not need a full-time software engineer anymore. This situation is quite promising because since software products have very high scalability, once development costs subside the product can very quickly become extremely profitable. This is also enabled by the fact that UzuCarto is currently using mostly open-source data, which they could later supplement with their own, proprietary data which was gathered for UzuVerse.

2.2 Weaknesses

2.2.1 Narrow Use Case

The typical workflow of an AEC project can be found in figure 7.

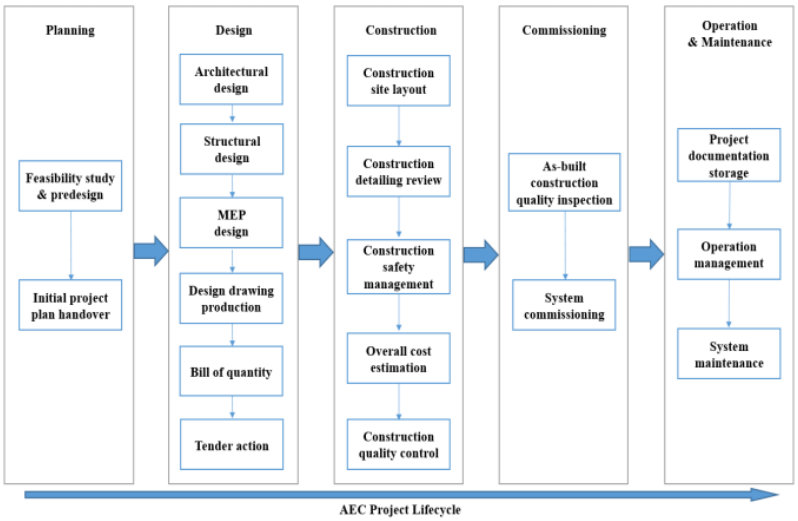

Figure 7: typical workflow of an AEC project (Chen & Tang, 2019)

As we can see, the feasibility study is only a small part of the very complex process, which usually spans many months and involves a lot of stakeholders. UzuCarto, which is only involved during this first step, is thus inherently limited in the amount of value it can capture for its clients. This was confirmed during our user interviews, which while promising, also showed that the level of detail in the data was not sufficient to be involved in the later stages of the projects. These steps today almost always involves a surveyor, whose full time job is going to the physical place and taking all the necessary measurements to build a much more accurate "digital twin".

In addition, due to the complexity of these projects, there are only a limited number of new feasibility studies each year. Architects mentioned numbers ranging wildly from 10 per year (Alp'Architecture, ABA) to as high as 100 (RDR)! Another important factor is that they are very different from a year to year basis, and Miguel Bermudez (RDR) mentioned that for them, some years it could be 100 studies in a year, but others it could be as low as 30, depending on the macroeconomic conditions, the types of projects cropping up, and natural fluctuations. Tom Doan from Swissroc mentioned that for them, this number ranges from 5 to 40.

To illustrate this, let's perform a small calculation to understand the number of clients Uzucarto would theoretically need to repay one year of the costs calculated in section 2.1.5 (roughly 125k CHF). As mentioned in appendix A, the estimated "costs saved" by Uzucarto today is in the order of magnitude of 390CHF per study. Architects responded positively to the 150CHF price point, so let us use that. Let's also estimate that on average, the number of feasibility studies per client per year is 20. Thus, the number of clients required to make 125k CHF in a year is

$$\#\text{ of clients} = \frac{\text{Target Yearly Revenue}}{\#\text{ of studies per year per client} \times \text{revenue per study}} = 42$$

With this back-of-the-envelope calculation, we have shown that to cover just a single (Swiss) salary and some very lean operational costs, you would need around 42 clients to break even. While this is feasible, it can be challenging for an early stage startup to reach this many businesses. It is also somewhere in between mass-market and entreprise business due to its low but B2B pricing, which places it in a difficult place from a sales strategy perspective.

It is worth mentioning that while this is noted as a weakness in order to contrast it with entreprise B2B solutions, which can charge thousands or tens of thousands per customer per month. This is also simply a question of firm strategy and positioning. It can be mitigated in many ways, and is not a static or inherent part of the product, since the product can expand and thus capture more value per customer. It is for example likely that UzuFly will release complementary products over time to slowly approach a more entreprise-scale solution (for example, UzuVerse in the medium term could provide interesting scalability options). It is also worth noting that as mentioned in section 2.1.5, if the product reaches a point where it can be self-sustaining, due to the extremely low operating costs it will be almost pure profit for Uzufly.

2.2.2 Threat of Substitutes

Another weakness of UzuCarto could be that there are very low switching costs for the user, and a medium number of substitute (the concept of "Threat of Substitutes" in Porter's Five Forces).

Indeed, there are several different possibilities for architects who want to build a geographical context for their 3D project models. Today, Uzucarto has the edge because its competitors are less developed, or in many cases are not at all present (as outlined in the workflow of section 1.1). However, as shown in Geneva with the SITG, cantons are capable of building very good open source platforms that also fill UzuCarto's aforementioned value proposition. While it is a minority (as the SITN, and others startups in this space have struggled to see true adoption from the market yet), all of these players are constantly iterating and there are emerging players like the KGK-CGC who could potentially develop

very strong competition for Uzucarto (for more detail, see section 1.3).

This is especially problematic when you consider that switching costs are quite low for users. If a new open source platform becomes available, there is almost no barrier for architects to be sticky (that is, to not use this other platform to upload their models to). This means that UzuCarto will have to constantly have to outpace its competition, and use methods to increase customer loyalty and minimize churn. There are ways for this to be mitigated; Possibilities include using a licensing pricing model, developing unique product features, having much better data accuracy, developing strong brand value, or benefiting from user habits. However, it is definitely something to look out for (churn being a very common problem for software businesses), which UzuCarto should plan for in its roadmap and future strategy.

2.2.3 User Power

Another concept coming from Porter's Five Forces Analysis is User Power, which is defined as the user's leverage over the business to provide better products at lower prices. Typical exarcebating factors are: a low amount of buyers, switching costs, and buyer price sensitivity.

In UzuCarto's case, being focused on architecture firms, there are a reasonable, though not huge, pool of customers they can pick from. To give an order of magnitude, according to the "Architectural Profession in Europe in 2022 Report" (commissioned by the European Union), there were about 1630 firms in Switzerland in 2014 (Mirza & Nacey Research Ltd, 2023). This same report estimates that the number of architects has grown about 28% since then, which, extrapolating to the number of active architecture firms, gives us something in the order of 2080 companies in 2022. It is also worth noting that since there are about 9200 architects in Switzerland (as of 2022 numbers), the average firm size is about 4.5 people, which is very small and suggests that the majority of architecture firms are run by a one, or two people. Thus, the "big clients" will likely hold a lot of the power in negotiating with Uzufly.

Another factor is that the construction industry is "very sensitive to economic fluctuations" (Pheng & Hou, 2019). Indeed, as seen in figure 8, the construction output varies significantly year over year, is very region-dependent, and is unpredictable. The result is that architects are quite price-sensitive. Firms are quite wary of paying too much for a license which has a fixed cost, in case it would be a slow year, and would prefer to have the flexibility of a pay-per-use model. This is especially true of the aforementioned small firms, whose number of projects will vary significantly from year to year. This gives some considerations for the pricing model, as the pay-per-use model is likely less profitable in the long run for Uzufly, but might be necessary due to (small) buyer preferences.

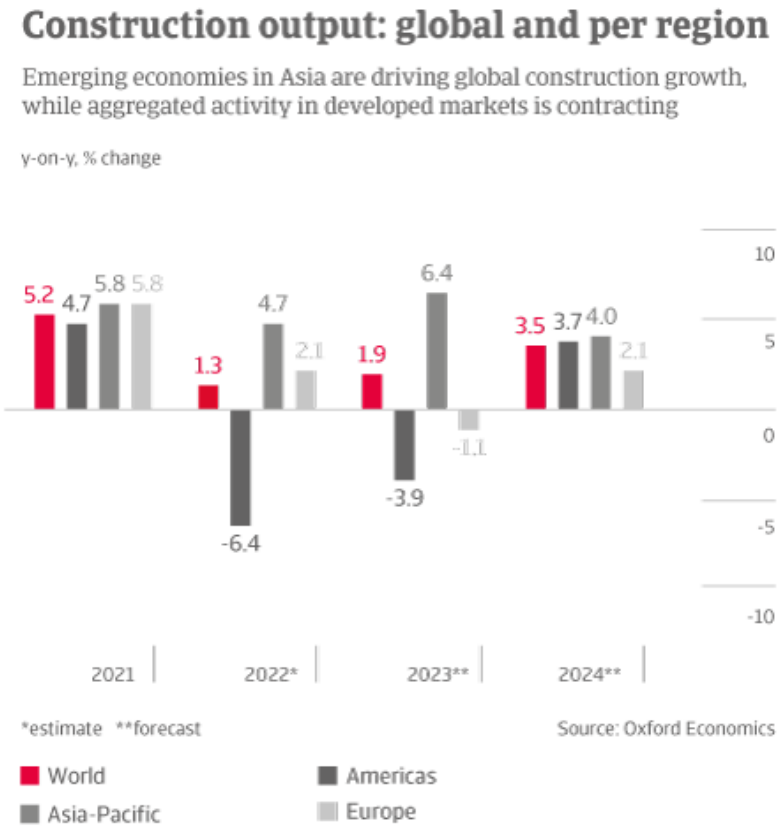

Figure 8: Construction output per year, by region (Atradius Collections, 2023)

2.2.4 Dependency on external data

Another key factor that UzuCarto needs to be wary of is its dependency on external data. The platform currently uses open access data like Swisstopo, and a combination of other non-proprietary data sources (which are paid, but theoretically public, and relatively cheap as previously outlined). There are several consequences that can come from this.

Firstly, the current value proposition to the user is time savings, not better data. This works today, at a time when the competition is not very intense and the space is still quite open, but as mentioned several times, if and when free or cheaper alternatives come around, then UzuCarto will (as it stands) only differentiate itself with features and good UX. This leads to a strong dependence on user adoption, brand power, and user habits which take a long time to develop. Having high-quality proprietary data (which can come from their own modelling, or from partnerships), could be invaluable to maintaining a strong competitive edge in the long run.

Secondly, the barrier to replication of UzuCarto's platform is somewhat low, in the sense that some architects today already sometimes integrate some of the same sources UzuCarto uses. Other platforms, like Geneva's SITG are ahead of UzuCarto in Geneva, notably because of their higher quality (and proprietary) data for the canton. This dependence also means that UzuCarto cannot easily increase data quality and adress specific needs evoked by the users, such as more resolution on the contour lines, or better vegetation without needing to build its own dataset.

This dependence, as previously mentioned, is still perfectly fine given the stage the project is in (MVP, testing with early users), and the state of the competition. However, given the market dynamics and UzuFly's own expertise in building digital twins, it is a current weakness which can be "easily" addressed to increase its product defensibility, lower the threat of substitutes, and possibly widen its use case (as more precise data opens more doors).

2.3 Opportunities

This section will outline several positive trends and opportunities for UzuCarto to capitalize on its strengths, and possibly address some of its weaknesses.

2.3.1 3D Modelling on the rise

The thesis and opportunity that 3D modelling is on the rise is the primary vision and reason of being of Uzufly as a company. Digital twin businesses are booming, and while credibility to "forecast numbers" must be taken with a grain of salt, the vast majority of studies point toward an exceptionally high projected CAGR of anywhere from 25% to 40%. This represents a 10-20x in market size in the next 10 years (Global Market Insights, 2023), and we are currently only at the very beginning of these developments. According to these reports, this exceptionally high growth will be made possible by recent and future advancements in Industrial (mostly in design and manufacturing) Internet of Things, cloud platforms, and big data analytics (Grand View Research, 2024).

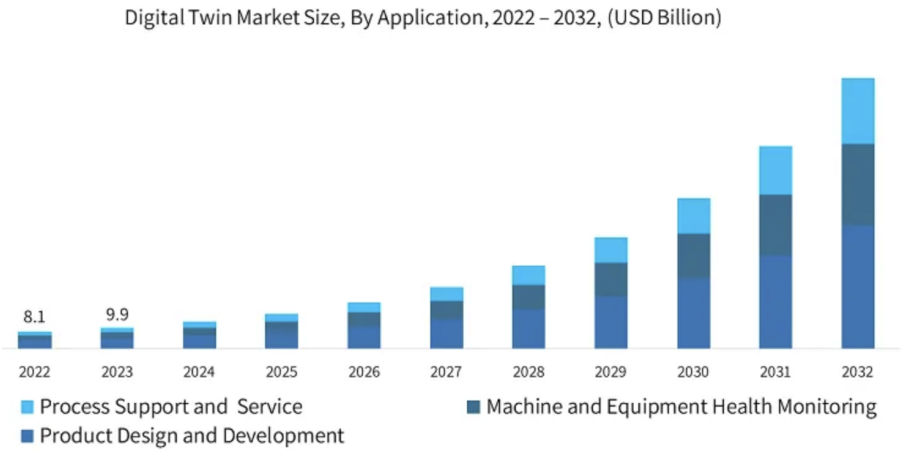

Figure 9: Projected growth of the digital twin market (Global Market Insights, 2023)

Through his previous work experience in drone imaging and urban digital twins with UK-based startup SenSat, which have received over $30 million in VC funding so far (Crunchbase, 2022), as well as his expertise in Civil Engineering from his EPFL degree, it became obvious to Romain Kirchhoff (the founder of Uzufly) that a significant opportunity could be found in Switzerland and central Europe working on digital twins for urban and architecture applications.

These trends represent a compelling opportunity for Uzufly and UzuCarto as the growing adoption of 3D models and digital twins opens up a larger portion of the substantial architecture market. Being an early mover allows Uzufly to cultivate deep expertise and establish a broad network in the field, potentially leading to significant network effects. Moreover, there is a chance to expedite the development of the Swiss market, outpacing

larger, slower-moving countries. By leveraging their position as pioneers, Uzufly can enhance user adoption of 3D technologies through user-friendly and intuitive solutions like UzuCarto, fostering customer loyalty in a market with few direct competitors.

2.3.2 Cheaper and easier data generation

Another significant trend for UzuFly and UzuCarto is the democratization of affordable and accessible data generation, particularly within the 3D imaging sector for construction. With projections suggesting that the aerial imaging industry will triple over the next decade (Future Market Insights, 2022), and the BIM industry expected to double within five years (Mordor Intelligence, 2024), alongside the anticipated surge in digital twins, these shifts forecast a dynamic transformation in data availability, collection methods, and management systems. These trends promise substantial advancements in performance, positioning UzuFly to capitalize on enhancements in drone technology, streamlined 3D modeling for architects and engineers, and more cost-effective solutions for managing large datasets.

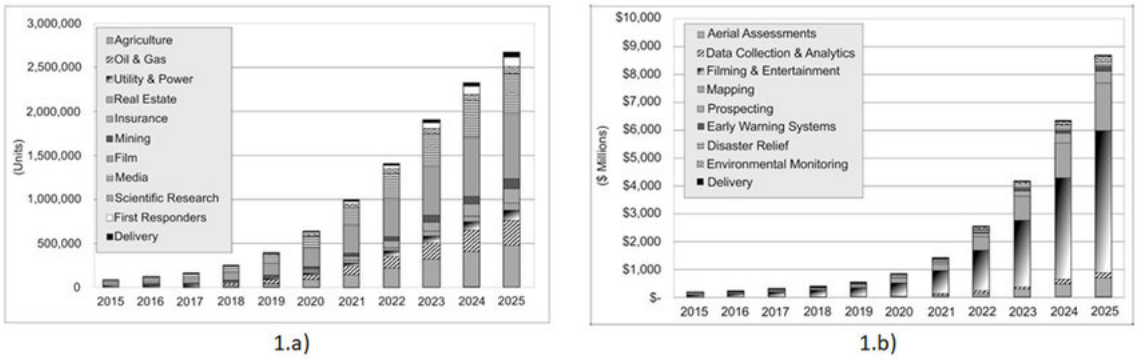

Figure 10: Forecasted drone (UAV) market growth by sector (Vidović et al., 2019)

Locally, there are ongoing federal initiatives in Switzerland aimed at enhancing the quality of open-access 3D data, with similar developments in neighboring countries. Although this might pose a threat as architects could opt to use freely available data, user feedback indicates a strong appreciation for the quality of life and time-saving advantages provided by UzuCarto. These benefits are expected to grow as UzuFly enhances the data quality, adds more features, and further customizes the product to meet user needs, offering a distinct advantage over generic open-access data that often requires additional processing. Additionally, the standardization and complexity of this data suggest that UzuCarto can expand geographically, applying the same code and methodologies across different regions.

At Uzufly's broader scale, a strategic move involves integrating UzuCarto with their flagship product, UzuVerse. This integration could significantly enhance UzuCarto's functionality by leveraging UzuVerse's superior data quality, detail, and interactivity. Transitioning from relying on freely accessible data to utilizing proprietary, high-quality data would not only elevate UzuCarto from a niche tool for feasibility studies but also evolve it into a more versatile platform. Users could effortlessly incorporate any project at any stage, benefiting from the increased detail and resolution necessary for advanced phases. This approach would address multiple previously identified weaknesses of UzuCarto while maximizing Uzufly's strengths in advanced geospatial data handling.

2.3.3 Strategic Partnerships

One of the major question marks around UzuCarto, and UzuFly's adoption, is the degree to which the users will accept switching workflows. This requires changing up not only their software stack but also the type of modelling they do (from 2D to 3D). This point is further developed in section 2.4.2. Changing user habit is one of the most notoriously difficult aspects to tackle as a company, and this is especially true of software professionals have used for sometimes their entire career.

One of the best ways to address this is to foster academic partnerships. This is a common strategy for entreprise grade software platforms, since the best way to change user habits is not to change them, but rather to simply directly form the "right" ones. Uzufly is here in a particularly promising position, because as an EPFL spin-off with strong links to the school, and geographic proximity it is in a great spot to be closer to students, and try and develop possible partnerships with architecture and civil engineering students. One could notably imagine a course or workshop(s) on 3D modelling using UzuVerse and UzuCarto as ways to save time on geospatial integration for those 3D models. Another, simpler way could be to hire working students or interns in these sections. As a student myself I noticed that there was outsized recognition to firms that were active on campus, versus others that never interacted with or gave opportunities to students.

In a similar way, working with national and cantonal authorities as partners could be a great opportunity to reach a wider market and benefit from governmental credibility. Uzufly is already partnering with ASIT/Viageo VD, which is the geospatial data "catalogue" in Vaud, by providing the 3D data for them, which has led to a couple (paid) downloads.

Data partnerships are also possible. Indeed, the cantons want to collect generic data but are very much open to collaborating with businesses to build tailor-made products (a direct insight from a conversation with the SITN (Neuchatel)). Cantons directly benefit from having higher quality feasibility studies, especially ones with more precise data on how the project might integrate itself into the commune/neighborhood, since it allows them to more accurately assess the effect this new project will have on the area. They could thus be incentivized to collaborate wih UzuFly to collect more specific data, offer preferential rates, or help promote Uzufly to architects asking for this data.

2.3.4 Widening the Use Case

As mentioned in section 2.2.1, the current use case for UzuCarto is quite limited, with the scope only being providing the geospatial data at the end of feasibility studies, which saves architects a couple hours or a day at most. This inherently caps the possible value UzuCarto can extract per customer, which threaten UzuCarto's financial viability as a project.

Fortunately, there are many different possibilities to widen the use case of UzuCarto and make it a more valuable tool for both UzuFly and its clients. Based on the feedback from the user interviews on how clients use the product, several ideas come to mind. Native plugins or expansion into adjacent needs, like 3D visualization, could be a promising route (Enscape, for example, charges $50-75 per month (Enscape, n.d.)). Integration with more precise data could also give a massive boost to the use case (which could directly increase the number of user segments). This can either come from in-house development (UzuVerse), or through strategic partnerships (Cantons, Swisstopo, ...).

2.4 Threats

2.4.1 Small Market Size

A critical factor for UzuCarto is the relatively limited market size it targets. A bottom-up calculation of market size, assuming a rate of 150 CHF per feasibility study with an average of 20 studies per client per year, illustrates this point. Referring to figure 11, the number of architectural practices in Switzerland has increased from 7,200 in 2014 to 9,200 in 2022, marking a 28% growth. Extrapolating from this growth, we can estimate approximately 2085 practices currently operational in Switzerland.

$$\begin{aligned}\text{Market Size} = &\#\text{ of total clients} \times \\ &\#\text{ of studies per client per year} \times \\ &\text{revenue per study} \\ &= 5,25\text{CHF Million}\end{aligned}$$

The Architectural Profession in Europe 2022

Switzerland/Suisse

Social & Economic Social & Economique
construction / GDP previous year construction / PIB année précédente

	2012	2014	2016	2018	2020	2022
Population	7 954 662	8 136 689	8 325 194	8 482 152	8 606 033	8 670 300
GDP PIB € m	474 689	489 673	604 510	601 327	628 107	687 110
GDP/PIB head/habitant €	59 674	60 181	72 612	70 893	72 984	79 249
Construction € m	n/a	47 311	70 218	75 721	68 569	82 193

Architectural Profession Profession d'architecte

	2012	2014	2016	2018	2020	2022
Architects Architectes	5 400	7 200	7 300	7 400	7 500	9 200
% Male Homme	n/a	73	n/a	n/a	n/a	n/a
% Female Femme	n/a	28	n/a	n/a	n/a	n/a
% <40 years <40 ans	n/a	33	n/a	n/a	n/a	n/a
Practices Bureaux	n/a	1 629	n/a	n/a	n/a	n/a

Architectural Market Marché de l'architecture

	2012	2014	2016	2018	2020	2022
Market Marché (€ m)	n/a	624	n/a	n/a	n/a	n/a
Average turnover per practice (€) : Revenu moyen par bureaux d'architecture (€) :						
2 persons personnes	n/a	187 577	n/a	n/a	n/a	n/a
6 - 10 persons personnes	n/a	962 959	n/a	n/a	n/a	n/a

Response Réponse

	2012	2014	2016	2018	2020	2022
Participants Répondants	n/a	200	n/a	n/a	n/a	n/a
Accuracy of results 95% confidence +/- Précision des résultats: 95% confiance	n/a	+/- 6.8	n/a	n/a	n/a	n/a

Field of Employment Domaine d'activité

	per cent pourcentage					
	2012	2014	2016	2020	2020	2022
Sole Principals Dirigeant unique	n/a	22	n/a	n/a	n/a	n/a
Partners & Directors Associé dirigeant	n/a	37	n/a	n/a	n/a	n/a
Private practice Salaried Salarié – Secteur privé	n/a	21	n/a	n/a	n/a	n/a
Private in-house L'industrie / commerce	n/a	1	n/a	n/a	n/a	n/a
Freelance Indépendant	n/a	3	n/a	n/a	n/a	n/a
Other Private Autres – Secteur privé	n/a	11	n/a	n/a	n/a	n/a
Local / central government Collectivité locale / gouvernement	n/a	5	n/a	n/a	n/a	n/a
Other Public Autre – secteur public	n/a	2	n/a	n/a	n/a	n/a

Earnings Revenus

	Average earnings €* Revenu moyen en € *					
	2012	2014	2016	2018	2020	2022
Sole Principals Dirigeant unique	n/a	90 175	n/a	n/a	n/a	n/a
Partners & Directors Associé dirigeant	n/a	98 373	n/a	n/a	n/a	n/a
Private practice Salaried Salarié – Secteur privé	n/a	69 271	n/a	n/a	n/a	n/a
Private in-house L'industrie / commerce	n/a	n/a	n/a	n/a	n/a	n/a
Freelance Indépendant	n/a	59 024	n/a	n/a	n/a	n/a
Other Private Autres – Secteur privé	n/a	90 175	n/a	n/a	n/a	n/a
Local / central government Collectivité locale / gouvernement	n/a	111 489	n/a	n/a	n/a	n/a
Other Public Autre – secteur public	n/a	n/a	n/a	n/a	n/a	n/a

* Earnings values are unadjusted for PPP * Revenu moyen NON ajusté par PPA

Figure 11: summary of the Swiss market (Mirza & Nacey Research Ltd, 2023)

The market size for UzuCarto is relatively small, posing a potential threat to the financial viability of the project. Despite the advantage of low operating costs—excluding salaries—this limited market scale is a critical factor to consider for the product's future sustainability and strategy at launch.

Fortunately, there are several opportunities to expand UzuCarto's market. As mentioned in section 2.3.2, the product is well-placed to extend its reach into neighboring countries once established in Switzerland, particularly as open access data becomes more prevalent across Europe. This standardization simplifies the integration of various data sources into UzuCarto's system. For instance, expansion into France could substantially increase UzuCarto's market flexibility. Additionally, broadening the product's use case could further increase market size, a progression likely as UzuVerse evolves into a more comprehensive product.

2.4.2 Requires architects to change workflow

User habit is a fundamental aspect of technology adoption. It can drive loyalty to a brand even in the face of less expensive alternatives, but it can also present significant challenges when introducing new software like UzuCarto. Architects, particularly those with many years of experience using specific tools, may be hesitant to adopt new software, regardless of its potential time-saving benefits. This inherent resistance can introduce friction in the adoption process of UzuCarto among architectural professionals.

In addition, architects are already managing a complex workflow involving multiple steps, and several actors. In the short conversation about feasibility studies we had, 9 out of 11 of the architects mentioned at least 2 software products they already use. This doesn't take into account the fact that all of them had to use external sources for their data, to integrate it into CAD software (from screenshots, data from the web, or surveyor data). Although this fragmentation presents an adoption barrier, the specialized nature of UzuCarto might actually simplify these complexities, potentially making the transition to using a new, dedicated platform more appealing.

2.4.3 Slow-moving industry

The Construction industry is generally considered to be slow-moving (LetsBuild, 2023), due to the complexity, regulation constraints, and resistance to change of the industry. Indeed, construction projects are very complex projects involving many stakeholders over multiple months or years, in a highly regulated space. There is also a strongly risk averse culture, which is not wholly unwarranted as the industry manages very large scale projects, and thus values "proven and tested solutions", and hands-on, proven experience.

As a result, a lot of the work is still done in pen-and-paper and isn't digitized yet, which makes digitalization (through improvements such as bringing 2D modelling to 3D modelling) all more difficult to pull off. This is another major challenge UzuCarto, and UzuFly more broadly, will have to tackle. While there is a strong uptick in number of practices using 3D, and this trend is only getting stronger, the time to adoption in the construction industry could be several years behind other more fast moving sectors like healthcare, industrial industries (automotive, etc), or tech sectors. As an example, BIM solutions were developed as early at the 90s, but even today, 30 years later, some firms only have around 20% adoption of BIM (as explained by Swissroc architect Tom Doan). Thus, despite "lots of efforts from the firm management to start using this technology", only about $\frac{1}{5}^{th}$ of architects know how to use 3D, and about the same proportion use BIM.

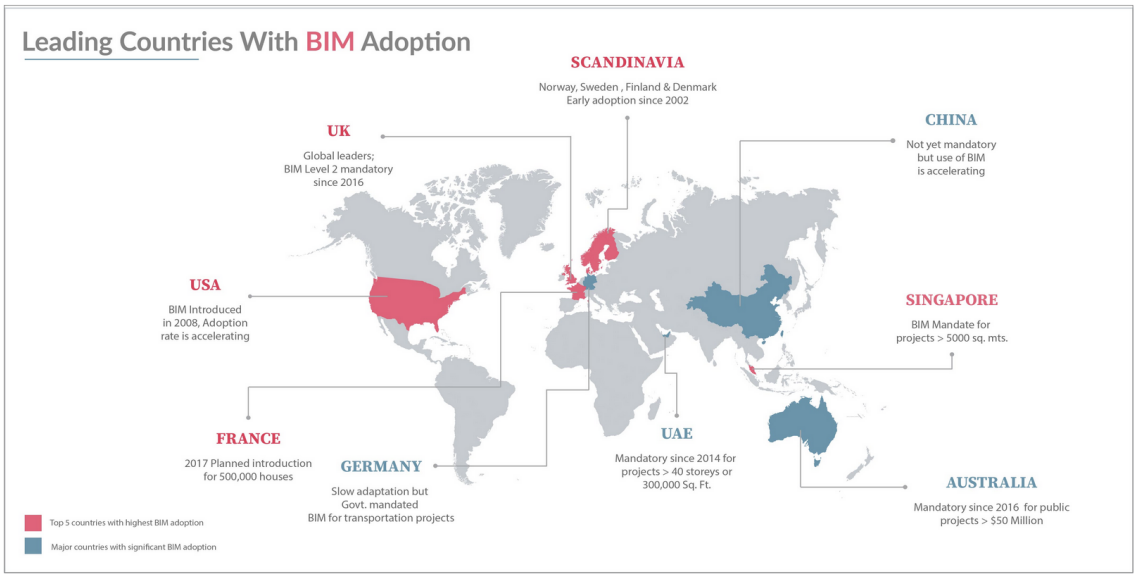

Figure 12: BIM adoption around the world (BIM, 2022)

Thus, while the timing of UzuCarto might be just right for the general digital twin macro trend playing out, the threat of "being too early in a slow moving industry" cannot be discounted, and must be taken into account. While this is partially mitigated by the strategy of targeting architects, who are probably among the most tech-sophisticated actors in the industry, in order to get broad adoption from the industry of 3D modelling there will need to be an important shift in approach to technology (with the required first step of finally digitizing the industry).

2.4.4 Open Access data development

A final threat to look out for is the strong trend of open access data quality increasing, usually by state or cantonal actors with significant credibility (playing to the risk aversion point mentioned earlier). As shown by the SITG platform in Geneva, if the free product is good enough, it will see almost complete adoption by the architects who can benefit from it. This is an opportunity, but broad democratization of open source platforms can also be a big threat to UzuCarto's model, forcing it to become a more niche, premium product. Indeed, it is unknown how the market will react to freely accessible data becoming higher quality. Will they immediately switch out of "plug and play" tailored-to-them products like UzuCarto, in favor of free data they can assemble themselves? Will the public and more general platforms currently being developed be of high enough quality to be of direct use for the architects?

This ultimately depends on how well adopted UzuCarto is at the time when these solutions become available, and how much value architects place in "plug and play" solutions. Uzucarto will inevitably also have access to higher quality data at that time, which makes it a question of how much time can UzuCarto save for its customers, and is there a jump in quality and user experience. The user interviews were very promising and show immediate usefulness to the market, but it is important to note of this longer-term threat of open access data and platforms potentially supplanting UzuCarto on the market.

3 Recommendations

Given the insights gathered from the SWOT analysis and the user feedback, the following strategic recommendations are proposed to enhance UzuCarto's market position and operational effectiveness:

3.1 Leverage Emerging Market Trends

Capitalize on Digital Twin Growth: Aligning UzuCarto more closely with the booming digital twin market by incorporating it into a broader digital twin application, such as UzuVerse in the short to medium term could prove instrumental. This shift could enhance its capabilities to support not only feasibility studies but also later stages of projects, and thus permeate the use of 3D modelling throughout the process.

Exploit advancements in data generation: Uzufly is already heavily focused on using cutting edge drone technology to continually improve the data quality and detail of UzuVerse. Transitioning to using a mix of open access and proprietary data for UzuCarto could significantly enhance UzuCarto's value proposition and accuracy, setting it apart from competitors relying solely on public data sources.

3.2 Expand Geographic and Segment Reach

Geographic Expansion: It could be beneficial for UzuCarto to consider exploring opportunities in international markets, especially targeting regions that are standardizing open-access data and adopting digital construction technologies. This expansion could expand its customer base, and reduce market dependency.

Tailoring to Different Segments: There might be value in customizing UzuCarto for various architectural segments, and adjacent industries. For instance, two of the current clients of UzuCarto are not architecture firms at all, but rather a landscaping company and a firm focusing on underground caves. This suggests that the visualization of geospatial and integration with any kind of 3D CAD data appeals also to more niche, non-obvious customer segments. Deepening this analysis could yield significant positive impact and could help reduce reliance on architects.

3.3 Enhancing User Engagement and Platform Utility

Feedback-driven product development: Maintaining an ongoing dialogue with users through structured feedback mechanisms (such as user interviews, or user testing groups) will ensure that UzuCarto evolves in alignment with user needs and industry shifts. Combining insights from different users and customer segments could also help find unexpected product improvements that could set it apart from both start-up and public sector competition.

User Experience Focus Regular User Experience tests, as well as user feedback has helped bring to life features and small utility changes that streamline the use of the platform. Since Uzucarto differentiates itself primarily through its time savings and reduction of burdensome work, ensuring a top-notch user experience and interface can serve as a significant boost to adoption and use.

3.4 Leveraging Strategic Partnerships

Educational Collaborations: Establishing partnerships with educational institutions such as EPFL could expose architecture and engineering students to UzuCarto, 3D modelling, and innovations in the industry early in their training, fostering familiarity with the platform. Ensuring early exposure to future professionals, especially given UzuCarto's position as an EPFL spin-off, could provide significant opportunities down the line. For instance, taking internships or working students among architects, could help spread the word on campus and make the start-up well known among students, starting a domino effect that could significantly benefit UzuFly down the line.

Public Sector collaborations: Since the public sector has a big interest in making better data freely accessible and improving workflows, ensuring early and constant collaboration between public sector actors working on this and Uzufly could help build mutually beneficial relationships. This is possible because unlike other private sector actors like Luucy or Amenti, public entities like cantons have aligned, but separate incentives to develop these platforms. Cantons would like to boost efficiency in the construction sector, sponsor innovation, and develop useful tools for its inhabitants, whereas Uzufly has a similar vision but also wishes to be a profitable business. While specifics of course have to be seen on a case by case basis, Uzufly could broadly help lighten the load on cantons by tailoring the data to architects and 3D modelling integration, and cantons could focus on the data generation.

3.5 Pricing and Marketing Considerations

Flexible Pricing Models: Pricing UzuCarto is somewhat complex because the company would like to maximize for predictable, recurring revenue (through something like a license) whereas the user will be worried about fluctuations in usage (since the number of studies and new projects varies widely on a year to year basis). While a full pricing model development was out of scope of this analysis, several interesting insights naturally came up through discussions, which can be found in appendix A. The bottom line, is that a good first iteration is likely a flexible pricing model which incorporates both a pay-per-use model at an affordable price (for example a pricing per tile downloaded) for smaller practices, and a license/entreprise model (which could probably be more expensive) with unlimited access for larger practices (which perhaps is scaled by the number of users that use the license), who would like to also use it on a day by day basis and not only for actual projects (which has been mentioned as a big quality of life improvement by Thomas Lepoutre from Arcadie). It could also be offered for free for students, who would like to visualize their CAD projects with geospatial context more easily (building early habits, letting students experience the value proposition early on, and helping marketing efforts on campuses significantly).

Market Education Efforts: Uzufly's primary mission of transforming the way the construction and architecture industries interact with their clients by enabling them to use 3D data is at its core an education initiative. It is a well-utilized strategy in certain (especially technical) industries to frequently use explicitly educational summits, webinars, conferences, and workshops as a tool to educate the market. For example, at a larger scale, machine learning days at EPFL brings together lots of companies, professionals, and students to learn about very technical skills, and these workshops are often hosted by companies. While probably beyond what can be done in the short term for 3D GIS and modelling, Uzucarto can utilise "market education" and "content marketing", through webinars and other forms of online content, as an interesting marketing strategy that is in

line with the latest trends, and can help reach the broadest set of potential users: soon-to-be and new architects, and curious professionals who are already more digitized and thus more prone to being open to this sort of innovation.

4 Conclusion

UzuCarto's strategic position within the architectural software market leverages several key strenghts that address genuine pain points in the architectural workflows. With its intuitive user interface and seamless integration capabilities, UzuCarto successfully simplifies the complex and time-consuming process of integrating geospatial and architectural data for feasibility studies. This enhancement not only speeds up project initiation but also improves the quality of the output, thereby potentially transforming early project phases with significant efficiency gains.

However, the analysis also identifies critical weaknesses and threats that could impede or slow down UzuCarto's adoption and market penetration. The tools' utility is largely confined to the preliminary stages of architectural projects, which, while crucial, represent a narrow segment of the broader architectural process. This limitation, coupled with the emerging trend of high-quality open access geospatial data, poses a significant challenge. UzuCarto must thus continue to innovate and possibly broaden its application scope to maintain relevance and appeal to its users in a rapidly evolving market.

The outlined recommendations suggest that there are many opportunities for growth and expansion, particularly through strategic partnerships and leveraging macro trends such as the increasing availability of cheap, high-quality data. UzuCarto's potential integration with more detailed digital twins from UzuVerse and its possible expansion into other geographical markets could significantly widen its use case and market size. Furthermore, fostering academic partnerships could facilitate smoother adoption among new generations of architects who are more accustomed to digital workflows. The exploration of flexible pricing models and enhanced market education efforts can also play crucial roles in maximizing UzuCarto's market penetration and user engagement.

To conclude, while UzuCarto is well positioned to make a marked impact in its niche, its long-term success will depend on its ability to adapt to an ever-improving landscape of free data and to potentially expand its capabilities beyond the preliminary phases of architectural projects. The product's alignment with industry trends and user feedback suggests a promising trajectory, and the team at Uzufly has the tools it needs to navigate the outlined challenges with strategic foresight, and continous innovation.

A More Pricing Model considerations

Architects were very open to the 150CHF price that we sometimes mentioned. For instance, Severine Routhier from Alp'Architecture was initially quite reticent about having to pay for such a product when free data was available, but upon hearing the 150CHF quote mentioned that this was "nothing compared to what we could invoice". Several others, like RDR, Arcadie, or Doutaz mentioned that they were very interested at this price and that it was wholly reasonable.

During our call, Tom Doan at Swissroc did a small back-of-the-envelope calculation, estimating that he would be saving around 10 hours per feasibility study, for around 30 projects per year, which at a 150CHF/hour rate (that he used), meant:

$$\begin{aligned}\text{Potential Money Saved} = &\ \#\text{ of hours saved} \times \\ &\ \#\text{ of projects per year} \times \\ &\ \text{Average hourly salary} \\ &= 45\text{k CHF per year}\end{aligned}$$

This number is quite large compared to the others given to us (who estimated usually between 4 and 8 hours of saved time, and 20 projects), and the hourly rate is not wholly representative of the median architect salary in Switzerland, which is closer to 65CHF per hour (Talent.com, 2024). However, it shows that architects we showed the product to assigned quite a bit of value to a product such as UzuCarto, and thus gives UzuFly some flexibility in choosing a pricing model.

Using more broadly applicable and easier to back up numbers (6 hours saved per feasibility study, 15-30 projects per year on average, and 65CHF/hour hourly rate), this gives us 5850-11700CHF saved per year, per firm, and about 390CHF per study!

Purely extracting as much value in the short term is however not the only important consideration. UzuCarto is more of an "onramp product", which is designed to be as easy to use and wants to be as widely used as possible. Romain also mentioned that they are even hesitating to make it a free tool, to really democratize its use across the industry, and begin forming the habit of architects using 3D models in their workflows, which plays into the larger play of integrating UzuVerse into the market.

B User Interviews Methodology

At the beginning of the semester, when deciding on the methodology with which to follow with the user interviews in order to get maximal value from them, we decided to organise a call with Albéric Gros, a business development expert currently working at L.E.S.S.. Our main doubts about the product at that time (from an Uzufly perspective) were:

- How good is the UX, really? (Very important point to understand since it is close to the main value proposition of saving time and simplifying the workflow for architects)
- Will real projects that architects have work on the platform (can they load, what is the feedback there).
- Understanding user demand, and gathering feedback regarding what UzuCarto currently offers.
- Understand the actual demand; how much are people willing to pay? What pricing model should Uzufly implement?
- Understanding the landscape of potential users (who and how big are they, how many projects do they take on per year, how many of these projects are in 3D, what is their software stack, ...)

In our discussion with Albéric, here are the main points that he raised:

- You need data from at least 10-20 companies for the trends to be significant
- He recommended the creation of a "user testing group": a couple beta users who use the product for free, but give you feedback and data on how they use the product, what can be improved, and how the product feels in actual use.
- in addition to the questions mentioned above, we needed to understand:
  - Gathering quantitative data on how much time architects spend on their feasibility studies (to understand how much they could gain from using UzuCarto)
  - Understanding who takes the decisions (not super relevant to this SWOT analysis, but important for Uzufly)

We implemented all of these points into our questions, and had the following question "list" when entering user interviews:

Initial Questions

- Presentation of the company
  - Number of employees (by type of role)?
  - What is your role, and who makes the decisions?
- Current workflow & market potential analysis
  - Methodology used, data used, software used, purpose?
    - Time spent per project?
  - Number of projects per year?
    - Differentiation between feasibility projects and "concrete" projects

Testing

- UzuCarto (UX)
- UzuTiles (3D Data)
- What would be missing from our proposal (areas for improvement)?

Pricing

- How much?
- How often?
- How (per project / license / open source)?

Are you interested (why)?

- Payment
- Waiting
- User Testing group (four different companies) - Ready to do a test over 3-6 months with two weeks of feedback (UX & 3D Tiles - but not pricing)?

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