

Streamlining Bureau Quoting Operations

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This edition of TCT marks the launch of Asiga's new cloud computing software QuoteServer, which brings web-based quoting automation, document generation and part tracking to any 3D printing bureau. Asiga's CTO, Ray Ericsson, explains the motivation for QuoteServer and presents strategies for quoting 3D printed parts efficiently.

Where does your time go?

One of the most time consuming activities in a 3D printing bureau is accurately quoting jobs. A typical day runs something like this: You're trying to get production happening. But there's an ever increasing queue of quotes backing up and clients calling to find out their status. Meanwhile, your production staff are chasing other clients for more information because job details haven't been specified correctly or the files have errors. Suddenly, the day is over, and you're working late. Again.

Why does this happen?

3D printing bureaus receive a large number of parts every day that require quoting. Every job needs to be quoted – even the ones you don't win!

Each part takes a few minutes to quote. You have to open the CAD file, acquire the relevant parameters, enter the parameters into a

spreadsheet, and reply to the customer with an email or perhaps a formal quote document. All this takes time.

CAD packages don't provide all the necessary parameters to quote 3D printing processes properly. For example, how do you calculate the amount of support material required to print a part correctly? You need specialist software. As a result, quotes are typically inaccurate guesstimates of your real costs.

Quoting delays result in slower turn-around time for the client – typically the loss of a day or more. This diminishes the value of "rapid" prototyping and reduces client satisfaction.

Is there a solution?

Asiga has developed a new cloud computing platform called QuoteServer. QuoteServer is designed for 3D printing bureaus to automate quoting, ordering and production management.

QuoteServer is a completely web-based tool that can be configured and branded to your business in a matter of hours. QuoteServer gives a bureau the scalability and online presence of the world's biggest prototyping bureaus with zero up-front investment.



Here's some of what QuoteServer does:

- Creates a powerful website that allows clients to upload STL and SLC files for instant quoting and ordering
- Receives online payments with credit cards and PayPal
- Automatically generates professional documentation including order confirmations, invoices and delivery notes
- Manages accounts and payments and can interface to your existing accounting software or stand alone
- Keeps clients informed with automatic email notifications on their order's progress
- Communicates with web services of couriers like FedEx and UPS to generate real shipping quotes and airway bills automatically
- Allows fully customisable pricing strategies.

QuoteServer therefore automates the mundane aspects of running a 3D printing bureau. It's a tool that frees up your time and resources for growth. Here's what the quoting page of a bureau's QuoteServer might look like in action:



The Key Elements of Great Online Parts Quoting

In the remainder of this article I'll describe the key elements required for a successful online quoting system. I believe this is instructive for any 3D printing bureau manager to understand so that they can specify a quoting system that will meet their internal needs and the expectations of their clients.

Element 1: Cloud Architecture

A web browser is a powerful tool for delivering services over the Internet and interacting with databases. QuoteServer uses a cloud architecture to enable the delivery of quotes to clients and allow your staff to interact with the database. As a result, you don't need any special software in-house. Any Internet connected device with a web browser can become a

processing node for your bureau. This gives your bureau infinite scalability. You can seamlessly expand operations at your site or over multiple sites by simply connecting more computers.

Element 2: Automated Graphical Document Generation

Every one of your documents – from the order confirmation to the delivery note and final invoice – should include thumbnail images of the parts. Graphical documentation has so many benefits they seem almost too obvious to mention. It eliminates confusion for you and your client over what has been ordered. It saves you a lot of time referring to CAD files on a computer screen. Parts are easily matched to paperwork which reduces the chance of sending the wrong part to the wrong customer.

Unfortunately, standard accounting packages don't allow you to tag line items with unique images, and it would be a laborious task to grab screen shots yourself and paste them into your bespoke invoices. Automatic generation of

graphical documentation for every order is taken care of by QuoteServer.

Element 3: Barcode Tracking

Imagine working on a supermarket checkout in the days before barcode scanners! I did and it was terrible. Every item leaving the store needed data entry. This would be unacceptable in any modern retail store. And despite this powerful technology being so readily accessible now, so

many small businesses don't use it and wonder why they can't seem to break into the big time...

If your bureau is ever to achieve scalable efficiency, tag every part with a unique barcode. This allows you to access and update part information without using a keyboard or trolling through a computer file system. It also gives customers a clear part identifier when communicating with you.

Element 4: Spoken Word Feedback

Whenever you scan a QuoteServer barcode, the server streams spoken word feedback to your web browser for playback through your computer's speakers. This confirms your actions or alerts you to critical information about a job, all without having to touch a keyboard or look up at a screen. Every time you divert your eyes away

from the task at hand you lose valuable time, which ultimately costs your business money.

Element 5: Part Geometry Analyser

Pricing 3D printed parts require specific geometry parameters. In addition to part dimensions, the most important parameters are part volume, shadow volume and surface area.

Part volume is necessary for calculating the amount of material used to build the part.

Shadow volume is the volume in shadow when the part is illuminated from overhead. It is required to calculate the amount of support material used to fabricate the part. This parameter is not standard in normal CAD packages because it is specific to 3D printing processes.

Surface area is a very useful parameter. It may not be required for calculating the price of 3D printing a part, but is necessary for pricing post-processing actions. For example, polishing, painting and vacuum metalising processes will all scale in price according to the surface area of the part.

QuoteServer calculates the above parameters for every part and makes them available to your pricing formulae.

Element 6: Error Checking

You will often have to chase clients because they have sent you STL files with holes or other errors. If the client is aware of the errors they can often fix them. However, if you're doing things the traditional way, you won't realise the errors until the end of the day when you're setting up the machines and everyone else has gone home.

QuoteServer checks all uploaded files for errors and notifies the client. This gives your client an opportunity to repair the file themselves, or at least know that there may be an additional delay while their file is repaired and that it is their fault not yours.

Element 7: Flexible Pricing Specification

Your bureau's pricing strategies may be unique. For example, you may want to price small parts differently to large parts, or have fixed pricing for jobs fitting in specific bin sizes. You need the flexibility to be able to express this in your quoting system.

Furthermore, multiple processes may be linked together to specify complex offerings. For example, castings production may involve a combination of wax printing, investment casting and various finishing processes, priced separately and applied sequentially to a part. QuoteServer's pricing database allows infinitely customisable pricing formulas and process linkages to be specified, allowing complex production offerings to be defined in a simple and maintainable format.

Element 8: File Format Conversions

STL and SLC file formats are the standard inputs to most 3D printers. The problem is, not all CAD packages can generate both reliably, and not all 3D printers can accept both. Thus, a 3D printing technician will often have the need to convert files.

QuoteServer allows bureaux to specify a preferred file type for each 3D printing process. QuoteServer incorporates a robust slicer to convert STL files to SLC, and an integrator to convert SLC files to STL, automatically, if specified. This saves time at the end of the day when you are setting up your prints.

Element 9: Real-Time Commodity and Currency Data

Some 3D printing bureaux are exposed to commodity price fluctuation risk. These include jewellery prototyping companies and dental laboratories that produce precious metal castings. If the price of gold rises 10% overnight, you need to make sure your online quoting changes accordingly, otherwise you may be losing money on the job! Many bureaux are also exposed to currency exchange risk. If your 3D printer consumables are priced in US dollars and you bill your clients in Euro, you may need to incorporate this into your pricing formula.

QuoteServer obtains real-time commodity pricing for metals and currency exchange rates on a daily basis and makes them available to your calculations in a simple format. This allows your pricing to be accurate and minimise exposure to market fluctuations.

Element 10: Automatic Email Notifications

How often do customers call you asking for updates on the status of their parts? The entire reason they are using your service is because they want something fast! If you present them with a black hole after taking their order they will become increasingly agitated and crave feedback.

When you update the production status of part with QuoteServer barcodes, your customers immediately receive an automatic email telling them their job's new status. Keeping customers informed and managing their expectations will keep them happy, and keep them off your phone when you both could be doing more effective activities.

Element 11: Shipping Tools

Making a part is only half the job. The other half is getting it to your customer on time.

You should give your customer several shipping options. For example, if they are local, the fastest way may be to use a local courier service for same-day delivery. If they are interstate or international, you would probably use a tracked courier like FedEx or UPS. If you don't have a tracking number you can't ever be sure of delivery, so it's worth the effort.

Right: Each document contains thumbnail images making visual tracking easier.



Left: A standard invoice could delay picking, packing and lead to errors.

QuoteServer has a powerful shipping tools section that allows specification of arbitrary courier services and seamless integration with the Web Services of FedEx and UPS. This means you can present your customers with a range of shipping options, all priced in real-time, to their specified address. QuoteServer generates the shipping labels automatically. Your customer will be informed of the dispatch time and tracking number by automatic email notification.

It sounds too good to be true – what's the catch?

There is no catch. QuoteServer costs nothing to set-up and nothing to maintain. Any orders you receive through QuoteServer attract a small commission, less than a credit card fee. That means you can instantly reap the benefits of a professional quoting system and be cash-flow positive. If you don't use it or don't win the job, there's no cost, therefore nothing to lose and everything to gain.

Conclusions

Summing up, here's my overall analysis of why any 3D printing bureau seeking to improve customer service and profitability should investigate the benefits of an automated online quoting and ordering system:

- Your most mundane and repetitive bureau operations – quoting, document generation and accounting, are eliminated.
- Staff can be deployed more efficiently.
- Customers are served faster and are kept better informed so are happier as a result.
- Job turn-around is faster.
- Reduced risk of dispatch mistakes.
- No quoting errors eroding margin.
- Fewer and less qualified staff required for high-quality service delivery.

Automation may mean the difference between thriving or just surviving in the ever expanding world of 3D printing.

Asiga will be demonstrating QuoteServer at Euromold in Frankfurt, Germany this month at Stand E58.