



InSituPhoto

Interactive Visualization

See your house as it could be...

THE APPLIED TECHNOLOGY SERIES of the SIGUS Group
develops and promotes simple user-oriented tools and techniques.

A similar approach was developed and tested in Yangzhou, China,
during the summer of 2007.
'Computer Interface for Rapid Design and Cost Estimation with Residents'

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Introduction

This report explains InSituPhoto, a means of rapidly visualizing building siting, repairs, upgrades, and other architectural changes and tracking the costs of such changes. InSituPhoto can be performed quickly and on site with the use of readily available technology: digital camera, laptop computer, and portable printer. The process and the final product, a printed image, are intended to facilitate discussion between non-profit agencies, professionals (architects/contractors/developers) and clients, by building trust, providing a mutually comprehensible image, and creating a permanent record of the decisions reached. The concept for InSituPhoto was inspired by the frustration described by families in Louisiana whose homes either needed repair or replacement after Hurricane Katrina. These families and the nonprofit agencies assisting in the repairing and rebuilding homes needed a way to adequately dialogue with one another about the specifics of the repairs and construction.

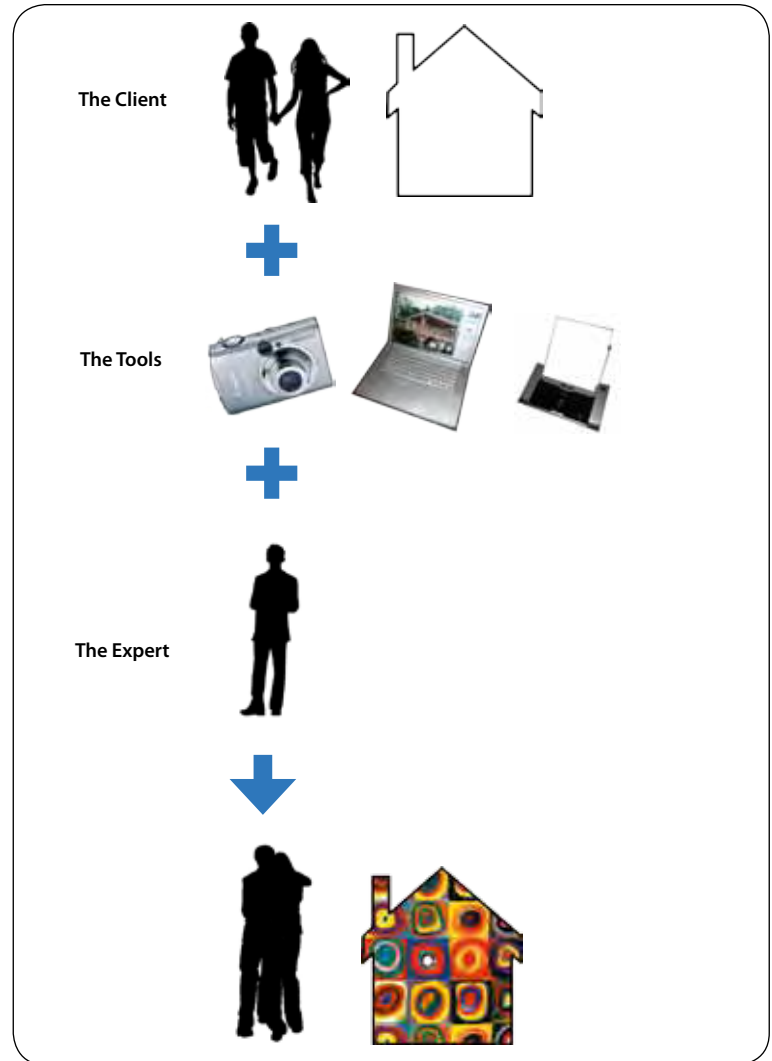
InSituPhoto relies on the use of Adobe Photoshop, a widely available imaging program that digitally simulates a darkroom. Photoshop allows the user to change colors of objects, distort images, combine elements from multiple photos, and perform countless other alterations, and it can be done “on the spot”!

After a brief discussion of existing precedents as well as alternative processes for InSituPhoto, the report details examples of the process largely drawn from the experience in Terrebonne Parish, Louisiana, when working with the NGO TRAC (<http://www.trac4la.com/>). It includes other applicable projects, and concludes with instructions on what is needed and how to use this process in the future.

The use of the InSituPhoto process implies that the modifications discussed will actually be carried out. If the agency cannot commit to making the improvements, the use of InSituPhoto is not recommended as a dialogue tool with users.

Interactive dialogue is the essence of InsituPhoto: *"on-the-spot"* decisions can be seen, adjusted and readjusted until a satisfactory solution is found. It encourages true partnering in decisions between client and professional.

What Is It?



Why Is It Useful?

The process can be used to:

- preview color options.
- view different options for a building's location on a site.
- relate building size to surrounding buildings and trees
- compare appearances of different choices.
- see different types of windows, doors, shutters, etc. on the building.

InSituPhoto provides benefits to clients and professionals alike:

- **Benefits to clients**

- Multiple options can be easily explored, and the client can make better decisions based on these "Photoshopped" variations.
- Printed documentation can be used as a 'contract' to ensure that promises are kept.
- "Photoshopped" images are easier to comprehend than architectural plans or renderings, which will increase clients ability to interact with professionals.
- Clients can use printed image to monitor the construction process by comparing the actual construction to the printout.

- **Benefits to professionals** (architects, contractors, developers, non-profit agencies)

- Professionals can receive clear "on-the-spot" feedback on their work.
- Rather than returning to the office to create a rendering and then waiting still longer to receive feedback from the client, the entire process is completed 'on the spot', saving the professionals time.
- Images can be used by agencies to raise funds for the project or other similar projects.
- Process will assist professionals in promoting ideas by supplementing verbal explanations with images that are visualizations of a final design.
- "Photoshopped" images will decrease frustration caused by misunderstood drawings and explanations.

What Are The Other Ways to Involve the Client?

Several other options for facilitating discussion between professionals and clients exist. However, each of these alternative processes has inherent problems, which are discussed below:

DISCUSSIONS BETWEEN ARCHITECTS AND CLIENTS: This is the customary method of working, because it is quick, requires no technical skills, and allows the client to provide feedback.

- **Problems**
 - Potential for misunderstandings.
 - Client or professional might forget the specifics of the decisions reached.
- **InSituPhoto Advantage**
 - InSituPhoto creates permanent record that is mutually understood by both architect and client.

ARCHITECTURAL PLANS: This formal means of communicating graphic information, which is essentially for trained professionals, consists of detailed drawings of a building that are intended to be used for construction. Plans convey very specific and detailed information about a building, leaving little room for interpretation.

- **Problems**
 - Potentially difficult for clients to understand.
 - Difficult to produce or alter on site.
- **InSituPhoto Advantage**
 - InSituPhoto makes plans more accessible to clients regardless of their level of comfort with reading plans.

ON-THE-SPOT SKETCHES: Sketches drawn “*on-the-spot*” can provide instant feedback for both client and sketcher. This process requires simple and cheap materials.

- **Problems**
 - Might give client unrealistic expectations, as sketch image and reality often differ
 - Requires ‘sketcher’ to possess a high level of skill
- **InSituPhoto Advantage**
 - InSituPhoto is photo-realistic, and is easily learned.

MODELS: Models have long been used to communicate spatial information. They help to portray the relationship of three dimensional spaces, and they can be designed to allow parts to be rearranged.

- **Problems**
 - Time intensive.
 - Requires bulky materials.
 - Too simplistic by itself; difficult to present details in a timely manner in three-dimensional form.
- **InSituPhoto Advantage**
 - Models could be combined with InSituPhoto in the future, so that the models would complement the images by showing massing.

In summary, InSituPhoto Advantages:

- InSituPhoto creates a permanent record that is mutually understood by both architect and client.
- InSituPhoto makes plans more accessible to clients regardless of their level of understanding when reading plans.
- InSituPhoto is photo-realistic, and is easily learned.
- Models could be combined with InSituPhoto in the future, so that the models would complement the images by showing massing.

What Is Needed To Run InSituPhoto?

TOOLS

The following equipment and software is needed for InSituPhoto:

- **IMAGE MANIPULATION SOFTWARE:** Adobe Photoshop or other digital image editing program
- **SPREADSHEET:** Microsoft Excel or other
- **COMPUTER:** Laptop (15" or larger recommended)
- **PRINTER:** Portable, battery-operated printer (for example, Canon PIXMA i P90)
- **DIGITAL CAMERA:** any small camera may be used, with cable for uploading to a computer
- **PAPER:** 8.5 x 11" photo paper ('glossy' paper works well)

SKILLS

In order for InSituPhoto to be used effectively, practitioners need simple knowledge in Photoshop. At the minimum, this document, plus a tutorial explaining InSituPhoto's specific steps in greater detail could be used to train individual practitioners.



Everything must be portable!

An agency or firm that intends to use the process on large scale would benefit from having several staff members trained to use InSituPhoto. A short training course, run by a trained Photoshop expert, would be the most efficient way of training the staff to use the process. The course could be completed in just two or three sessions, and would include:

- Explanation of purpose of process, and ways to dialogue with clients in process.
- Ways to be actively involved with the clients in discussing decisions.

- Digital Photography introduction: Shooting details, buildings, people, and shooting sites for collage.
- Equipment setup: Downloading images from digital camera, connecting laptop to portable printer, installing software.
- Brief explanation of Excel to instantly keep track of costs
- Photoshop lesson: Tool explanation (lasso, magic wand, clone stamp, healing brush, free transform), color correction, perspective, color fill, creating a library from photographs and from the web, image size, color mode, printing, saving to various file types.

- Understanding of perspective and other drawing technique.

How Is It Used?

InSituPhoto Examples

- Locate your house
- Customize your house
- Apply for a zoning permit
- Rebuild your home considering historical conservation

Tools used in the following examples

- MacBook Pro Laptop
- Canon Powershot Digital Camera
- Canon PIXMA iP90 Portable Inkjet Printer

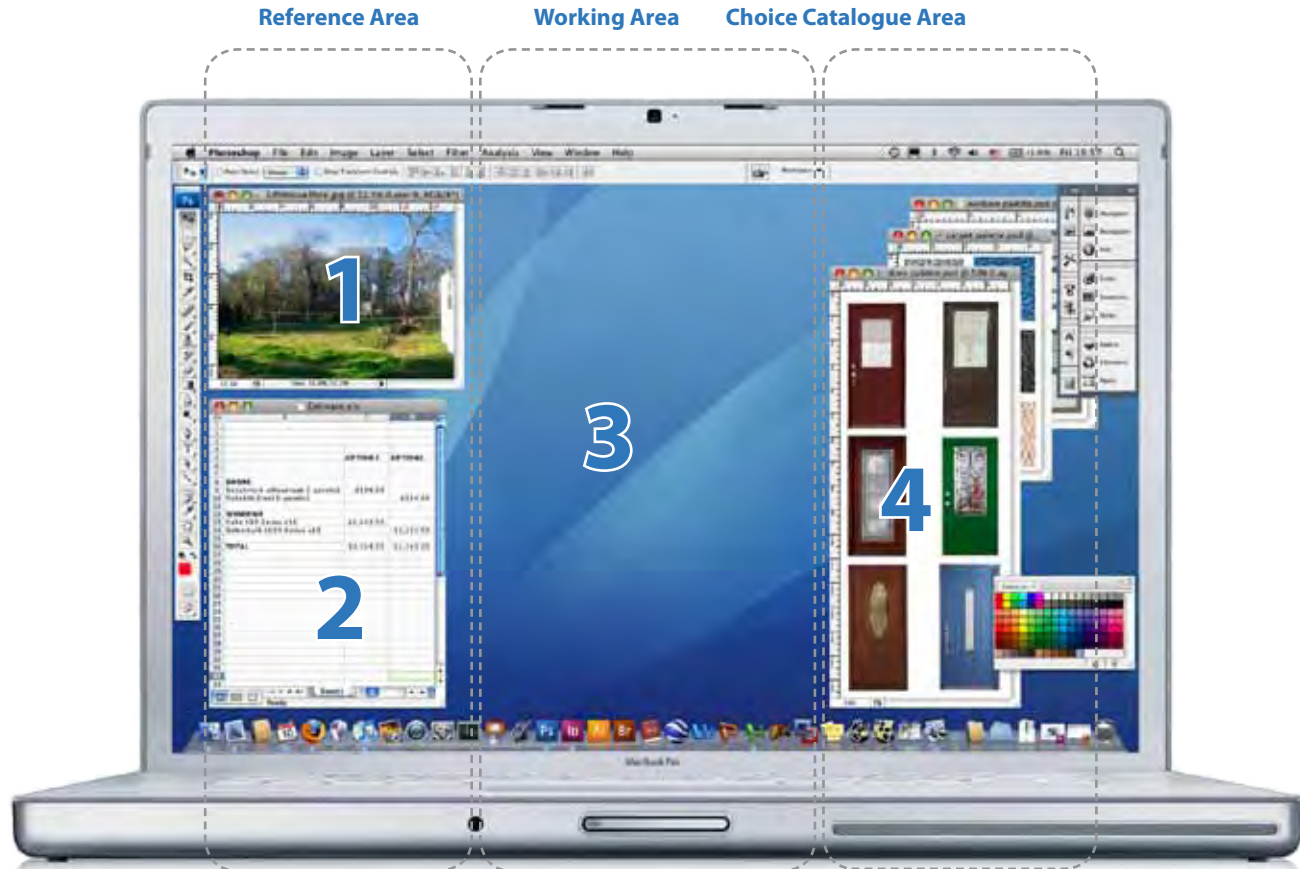
Skills needed

- Rudimentary photography skills
- Reasonably basic knowledge of Photoshop (crop, magic wand, lasso, healing brush, and clone stamp tools used)



Sample screen during an InSituPhoto session

Basic Elements



- There are four basic elements to show on the laptop screen
1. original image taken *"on-the-spot"* with a digital camera
 2. a spreadsheet to instantly track costs of changes made
 3. a working area
 4. the catalogue of choice to involve the client during the design phase

Not all the elements need to be shown on the screen. For example, when siting a house, the spreadsheet is not necessary. Photoshop tool palettes can be freely adjusted and placed anywhere on the screen.

Locate Your House

This examples involves a family in a LiftHouse to be built by the NGO TRAC in the Bayou of Louisiana. The goal is to decide “on-the-spot” location of the Lift House.

Process (completed within 1 hour!)

- Photographed existing LiftHouse in Chauvin, Louisiana.
- Photographed potential sites for new LiftHouse and property owners.
- Downloaded images to laptop and stitched together several together to create a panorama image.
- Prepared LiftHouse for collage by deleting background of image using Photoshop.
- Collaged existing LiftHouse and photo of property owners (to provide scale and to personalize the image) onto site photograph
- Adjusted scale, color, and perspective of LiftHouse in Photoshop to ensure a realistic match.
- Worked with property owners to decide location of LiftHouse.
- Saved and printed final image.
- Presented client and agency with printed image.



Modified image (lengthend and inclusion of lift using Photoshop) of Lift House as decided by the family



The site



The site with the future LiftHouse

Example 1.
Using InSituPhoto to place the **modified LiftHouse** on a future site near Houma, LA.



Modified image (using Photoshop) of LiftHouse as decided by the family



The Site



The site with the future LiftHouse

Issues and Lessons

The client was rather pleased with the final printed image. Minor, solvable problems included the following:

- The bright sun on the laptop monitor made it difficult to see the image. Work indoors or, if this is unfeasible, in the shadows.
- Deleting the background from the original LiftHouse slowed down the process. Do this step before arriving on the new site.
- First round of photographs did not include existing home. Make sure to include existing home and perhaps neighboring homes to provide context for the new LiftHouse.
- Distant views are often better for siting the new house. Two images are ideal: one from a distance to show siting, one closer to show colors and other details for exploring modifications.

*Example 2.
Using InSituPhoto to place the
modified LiftHouse on a future site
near Houma, LA.*

Customize Your House Interior

The process described above is just one of many potential uses for InSituPhoto. Private developers and Non-profit agencies, as well as architecture firms, city agencies, and contractors stand to benefit from the use of this process. The process would aid any situation in which trained professionals and the untrained public are communicating about the built environment.

If the process is used to facilitate conversations about home improvements or repairs, an additional step must be added to the process. For example, if a client is attempting to choose a new type of door, a catalog of door options must be assembled before meeting with the client. The size and source of the door images in the catalog depends on the capacity of the agency; if the agency only offers doors sold by Lowe's, as is the case with the Terrebonne Readiness and Assistance Coalition (TRAC), then the catalog should reflect this by consisting of images taken from Lowe's website.

If a wider selection of doors is offered, then existing local doors should be photographed, isolated from their backgrounds, and stored in an image library for use in future InSituPhoto sessions. These images should be saved into one large Photoshop file, with discrete a discrete layer for each individual door. This file can then be opened, reviewed by the client, and the selected door can then be dragged and dropped onto the principal image.

Catalogues of home features like doors and windows are easily accessible on the Internet



The images found online can easily be brought into image editing softwares like Photoshop

Swatches of available paint colors should also be prepared in a similar manner. These swatches can then be applied as fill colors with the Color blending mode in Photoshop.

This process requires a significant time commitment at the outset, but once the library is populated, both clients and professionals will greatly benefit from this resource.

Additionally, an Excel spreadsheet should be used to track the costs of each selection. (Excel, a Microsoft Office program, is a spreadsheet program that allows the user to digitally store and analyze data in a large table.) The file should be opened with Photoshop, and each selection should be priced and recorded on the spreadsheet. Various options can be included in separate columns of the spreadsheet. This should be printed with the final image as a permanent record for both client and professional.

*Sample screen appearance during an
InSituPhoto session
Above: interior door options
Below: selecting exterior door and comparing
the costs at the same time*

Apply for a Zoning Permit

Changes that require approval are clearer when explained in graphic form. After discussion with the home owner, the printout would be submitted along with the application. Repeated resubmittals would be minimized.



Rebuild Your Home Considering Historical Conservation

Showing homeowners what their homes could be like if adding historical elements is easy. Choices for historical elements are added on the right side of the screen. They could be taken from supplier catalogues or from photographs taken from similar buildings. Calculating costs is more difficult, and some discussion with builders beforehand is necessary.



The City of Boston's has used Photoshop to visualize potential façade improvements for shop owners. Storefronts are photographed, and the improvements are "Photoshopped" into the images in the Department's office or in a contracted firm's office, without feedback from the shop owners and with considerable delay. While this process effectively provides shop owners with that are more realistic than sketches or renderings, InSituPhoto would allow for feedback in a timelier manner, and prevent the contracting the work to outside design firms.

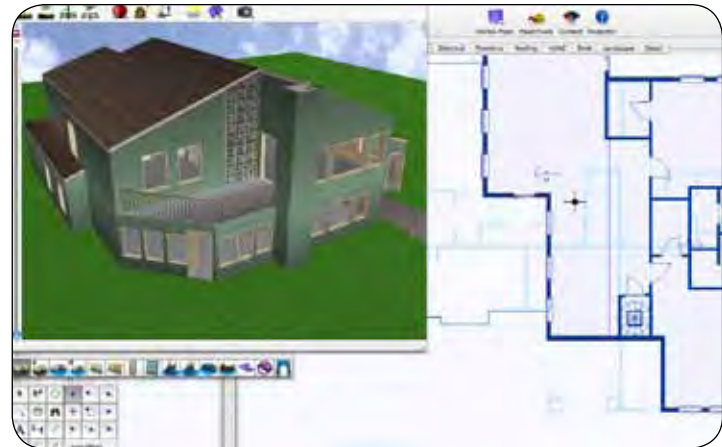
Similar processes are prevalent in the sale of online merchandise. For example, Toyota and Volkswagen's websites include a 'build' feature that allows the customer to customize their selected car. One can choose from various colors and interior and exterior accessories; selecting an option visually 'adds' it to the image of the car on the screen.

How Have Others Used Similar Approaches?



The VW website allows potential buyers to "build" their dream car

Some software programs allow amateur designers to use uploaded images of their homes to make visual modifications. Punch! Software's Home Design Studio allows users to work from sample architectural plans, drawn plans, or uploaded images of their homes. The program includes libraries of furniture, flooring options, roofing, and other materials. Users can view their project in 2D plan view or in 3D rendered view, and colors and materials can be changed with a few clicks. Despite the benefits of the Home Design Studio, users would need considerable time and practice in order to become comfortable with the program. Additionally, the renderings created by the program are not photo-realistic, and the entire program is biased towards large detached suburban homes, with little relevance to other neighborhood styles or building types.



Examples using software programs requiring steep learning curve.

How Can You Add To The InSituPhoto Basics?

Expansion of InSituPhoto could include the use of AutoCAD to translate the Photoshop changes into an architectural plan. Additionally, paper models could be used as an extension to InSituPhoto. In the image shown below, a foldable LiftHouse template was printed, cut, folded, and glued together. A scaled aerial image of the intended LiftHouse site was printed from Google maps. This process allows the model LiftHouse to be easily moved around the site to provide a quick view of different siting options.

With minimal investment of time and money, professionals could use InSituPhoto to greatly improve communication, interaction, trust, and efficiency with clients.



How Long Would It Take to Learn?

A Sample Training Program

A standard program would take two days, depending on the initial skill level of the students. Each instruction module is limited to a small group of students to allow direct support. Each student would be expected to have access to a laptop computer with Photoshop software installed. Printers would be provided for use during the course.

Photoshop Skill Module (½- 1 Day)

For students with basic knowledge of Photoshop (½ DAY): Focus on specific skills needed to distort the perspective of images, insert them into photos, and match colors.

For Photoshop novices (1 DAY):

Morning: orientation to Photoshop's menus, tools, and layers.

Afternoon: same as the ½ Day module.

Interaction Module (1 Day)

Morning: work through entire InSituPhoto process using sample images. Techniques for involving clients: practice changing colors and details of the building. Next, extract the entire building from one image, and insert it into another image with proper perspective. Practice to get the perspective right

Afternoon: use InSituPhoto with an actual client; siting a house is good way to become familiar with the InSituPhoto approach. Photograph the site context, select the best view, involve the client by working quickly on site, and print the image.

Questions?

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