D.J. GERBER, S-H.E. LIN. **Automation of generative design exploration for domain integration in architecture.** *Gerontechnology 2012;11(2):321;* doi:10.4017/gt.2012.11.02.246.00 **Purpose** Our research improves upon design theories, methods, and tools by enabling rapid design iteration and evaluation for multiple criteria in architectural design. It focuses on early-stage design automation through the development of technologies to reduce design-cycle latency and the reduction of uncertainty in early-stage design decision-making. The research presents tight coupling of the disparate building domain specialists –e.g. architecture and mechanical- fostering automation of domain integration. **Method** We present a detailed methodology which includes problem definition and literature review, tool definition, system architecture development, process map comparison of non-automated versus automated design, evaluation generation, test cases, and analysis of the data[1-3]. The tool development includes a description of custom technology development to support an extensible automated process map. The data generation, ranking and visualization method, uses a novel evolutionary algorithm within the system for automating optimization. We also discuss methods for developing the experiment, the results, and the initial research metrics. **Results & Discussion** The results of the research include a description of the system architecture and approach; the impact of the system and process on design-cycle latency, and on searching for design optimality across multiple objective functions or domains, in early-stage architectural-design problems. The discussion includes a description of future research steps, extending into more complex cases, inclusion of other domain-specific models, research goals, and objective functions.

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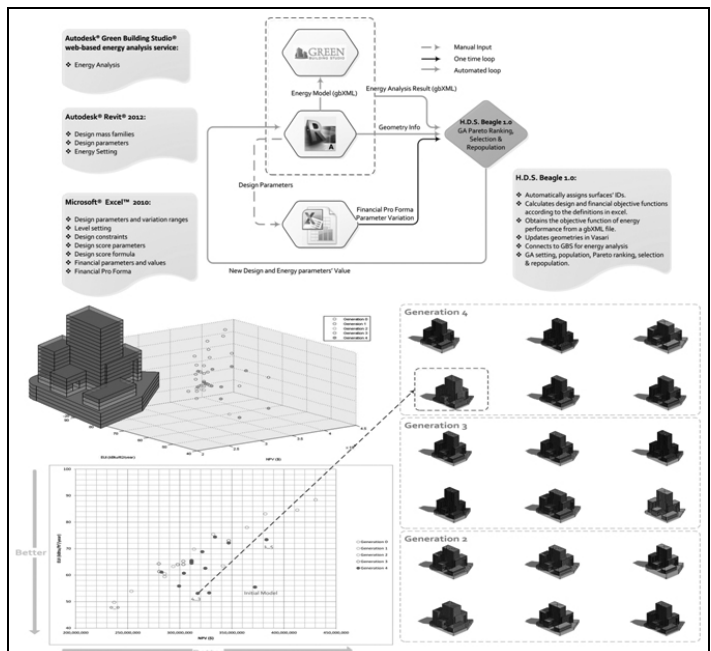
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Figure 1. System architecture and design process automation diagram with early data visualization of project geometry and objective function graphs