The creation of every product, from a simple pencil to a car and even a building or a city, starts with the design process. The decisions which are made during the first phase of the design process – the *conceptual phase* – have a crucial impact on many aspects of the final designed object. It is crucial that the designer has the right tools to aid him in the process: the knowledge and experience and the physical tools which supports that process.

The conceptual phase characterized by sketch creation using a drawing tool on a sheet of paper, mostly a semi-transparent one, that allows for further checking and improving till the completion of the design idea. Subsequent design phases, such as the production of hard-line drawings, detailing, and 3D visual representations and study, are supported by CAD software for many years. Computational assisting tools for the conceptual phase does not exist today, and even the way such a computerized tool should work and be used by the designer is yet to be decided.

Current CAD systems cannot be used as a conceptual design tool. The reasons has to do with the nature of conceptual design which is not linear, varies from one person to another even during the process itself. It is imprecise, incomplete and open to many interpretations. Entering the geometry/sketch into a CAD system is too slow, cumbersome, and demands almost total accuracy. All under a user interface that is not suitable for the conceptual design phase, where the advantage of using sketches is immediacy, fastness and tolerance for inaccuracy.

When approaching the creation of a computerized tool for the conceptual design phase, the essential questions are: If, how and how much of the current conceptual design process today - using a writing tool and a sheet of paper - should be preserved and become a part of the computerized system. How much can we change the conceptual design process and adapt it to the computer system and to a new way of work without crippling it and making the final product better.

Who's the horse and who's the wagon? Will the CAD system change the way a designer work in the conceptual phase of design and force him to a different route? Or will the CAD system allow the designer to set his own way of designing and adjust it self to his work habits while allowing him to lead the conceptual design phase?

The lecture is based on the M.Sc. research of the writer under the supervision of Profs. Gabi Goldschmidt and Dr. Abraham Yezioro.

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