

metamorphosis /,met ə'mɔːf ə'siːz/:
- any complete change in appearance, character, *circumstances*, etc.
- a *form* resulting from any such change.

"A *new model* of the world has emerged over the past few decades: the World-as-Organism. This new model inspires a desire to instill intelligence into objects, buildings and cities. It is a model that stands in contrast to the paradigm of the Industrial Revolution, or the World-as-Machine. While I believe that the new model will eventually become the *new paradigm*, it co-exists for the time being with the old model: our minds are already at home with this new view of the world, but we still employ the building practices and design traditions that we inherited from the industrial era." *Neri Oxman*

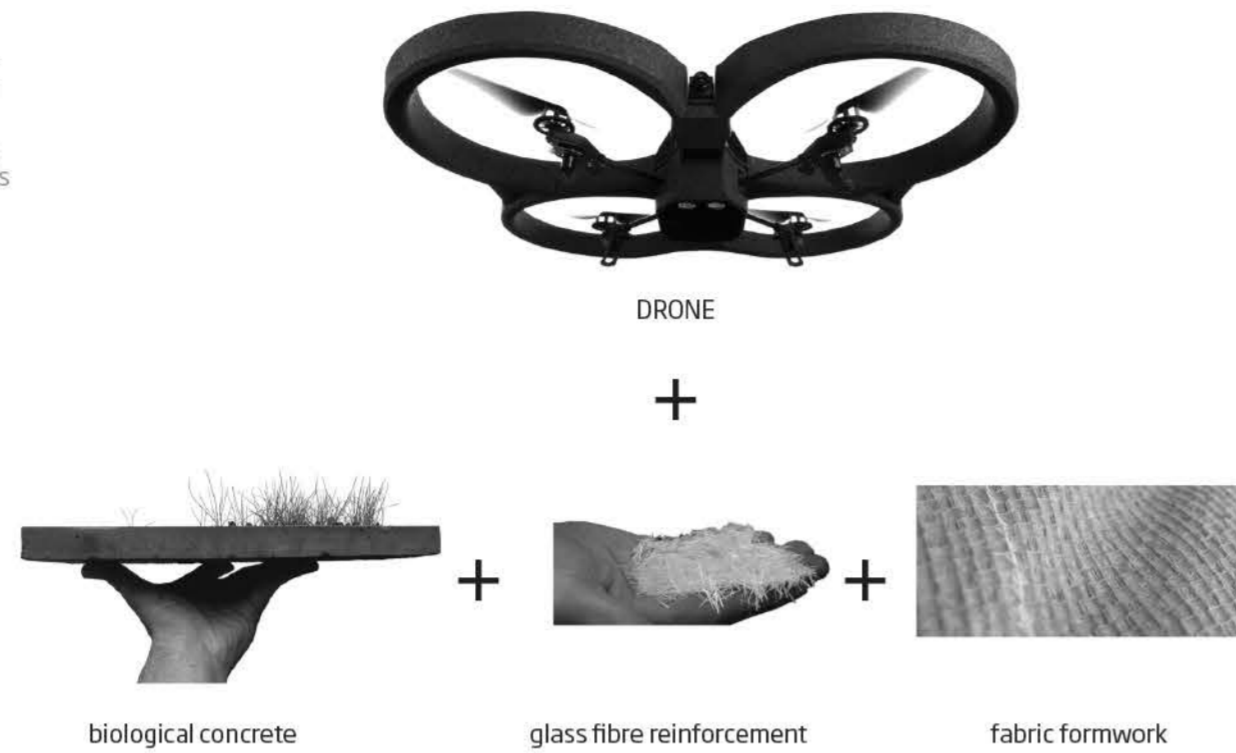
Technological development is accelerated in 21st century, especially in last decade. These developments affect our life, and change the way we live. *Concrete* is one of the biggest inventions in history, and it always *evolved* and *adapted* the time from Romans to today. And now, it should *adapt* the new era.

The proposal is a future projection of *concrete* application and adaptation.

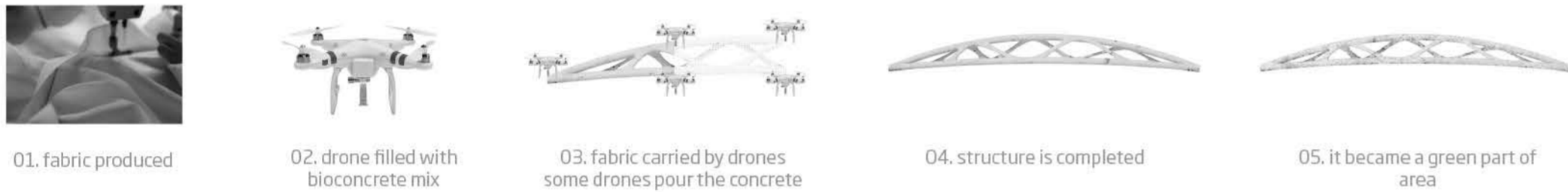
It propose a two-phased *metamorphosis*:

Phase_1: Metamorphosis in production and application technique.
Drones will be the alternative solution to classic application techniques. They could be used as fabric formwork carrier and stabilizer, concrete pumper, 3d concrete printer or prefabricated concrete carrier.

Phase_2: Metamorphosis over time.
By using biological concrete, the structure could metamorphose in time.



SCEN(E)ARIO_01 : DRONE AND FABRIC



scen(e)ario_01 : For the areas which are to reach and transport materials(like mountains and natural areas of Black Sea Region of Turkey), con/drone system could help the build process. Some drones could hold the fabric formwork, and other drones could pour the concrete mixture. The structure will adapt the nature and become green with the help of bio-concrete, in the long run.

SCEN(E)ARIO_02 : DRONE AS 3D CONCRETE PRINTER



scen(e)ario_03: con/drone system could be used in restoration of old structures. Most of drones could carry the prefabricated concrete bricks, and some drones could connect them or hold the formwork. In time, new parts will become green, and differentiate from old structure. Understanding the new installed parts is one of the principles of a good restoration.

SCEN(E)ARIO_03: DRONE AS CONCRETE BRICK CARRIER



ADVANTAGES

DRONES:

- Reduce CO₂ emissions
- No fixed operational hours
- Reduce safety risk
- Accuracy
- Accessibility to hard to reach areas
- Low cost compared to construction machines

FABRIC FORMWORK:

- Lightweight
- Low cost
- Reduced labour cost
- Improved surface finish and strength
- Reusable
- Aesthetic
- Reduced embodied carbon
- Less material use

BIOLOGICAL CONCRETE:

- Green layer with moss, lichen or algaea
- Capture CO₂ and release oxygen
- Green layer acts as thermal insulation



scen(e)ario_02: Mini drones could be used by municipalities or private organizations in crowded areas of the city to make street furnitures and installations. Later it could become a green part of the area or it could be moved another areas of the city by drones.

