

Key Abstractions and Mechanisms

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Lecture Outline

- 1 **Definitions**
- 2 **Key Abstractions**
- 3 **Key Mechanisms**

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- 3 Key Mechanisms

Definitions

Key Abstraction: Class or object that forms part of the vocabulary of the problem domain.

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Mechanism: Any structure whereby objects collaborate to provide some behavior that satisfies a requirement of the problem.

Ex: **Delegation** among objects

from Dictionary

Mechanism (*noun*)

- 1 an assembly of moving parts performing a complete functional motion, often being part of a large machine; linkage.
- 2 the structure or arrangement of parts of a machine or similar device, or of anything analogous.
- 3 machinery or mechanical appliances in general.

Mechanisms represent patterns of behavior

Ref: <http://dictionary.reference.com/browse/mechanism?s=t>

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Key Abstractions

Approaches to identification

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- Discovery (with help of domain experts)

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Refining Key Abstractions (iterative approach)

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Common refining tasks are:

split a class

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Refining Key Abstractions (iterative approach)

Common refining tasks are:

**split a class, promote a class,
reduce semantic gap in class hierarchy**

Naming Key Abstractions

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- Selector operations should imply a query or be named with verbs of the form "to be." (Ex: extentOf or isOpen).

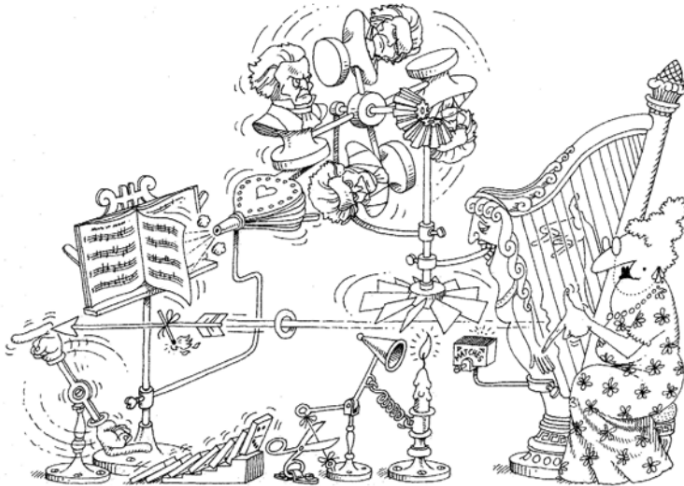
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- Beconsistent with style.

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An Example



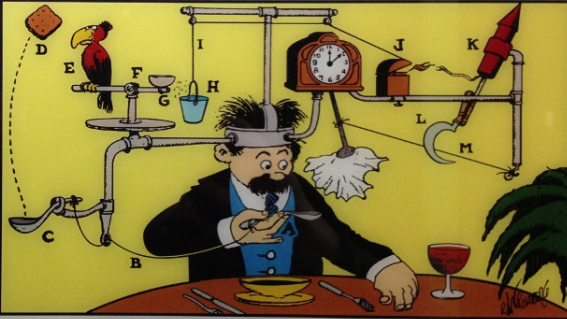
Mechanisms are the means whereby objects collaborate to provide some higher-level behavior.

An Example

Self-Operating Napkin

By Rube Goldberg

PROFESSOR BUTTS WALKS IN HIS SLEEP, STROLLS THROUGH A CACTUS FIELD IN HIS BARE FEET, AND SCREAMS OUT AN IDEA FOR A SELF-OPERATING NAPKIN. AS YOU RAISE SPOON OF SOUP (A) TO YOUR MOUTH IT PULLS STRING (B), THEREBY JERKING LADLE (C) WHICH THROWS CRACKER (D) PAST PARROT (E). PARROT JUMPS AFTER CRACKER AND PERCH (F) TILTS, UPSETTING SEEDS (G) INTO PAIL (H). EXTRA WEIGHT IN PAIL PULLS CORD (I) WHICH OPENS AND LIGHTS AUTOMATIC CIGAR LIGHTER (J), SETTING OFF SKY-ROCKET (K) WHICH CAUSES SICKLE (L) TO CUT STRING (M) AND ALLOW PENDULUM WITH ATTACHED NAPKIN TO SWING BACK AND FORTH THEREBY WIPING OFF YOUR CHIN. AFTER THE MEAL, SUBSTITUTE A HARMONICA FOR THE NAPKIN AND YOU'LL BE ABLE TO ENTERTAIN THE GUESTS WITH A LITTLE MUSIC.



Rube Goldberg is the ® & © of Rube Goldberg Inc.

Ref: http://wordsmith.org/words/images/rube_goldberg_large.jpg

Mechanisms

Kinds of patterns seen

- 1 Language Idioms (Ex: style guides)
- 2 Mechanisms / design patterns (Ex: MVC, Delegation)
- 3 Frameworks (Ex: Elipse, Netbeans)

You Said It!

Design patterns [are] a new mechanism for expressing design structures.

—Gang of Four, Design Patterns