

# IT Craft

OTUG - October 2009

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# IT's Not Going to Get Any Better

- Spend \$250 Billion to develop 175,000 projects
- Average \$2.3M (large), \$1.3M (medium), \$434K (small) per project.
- Cancel 31% of projects before completion
- Show 189% cost overruns for 57% of projects
- Deliver 16% of small/medium projects on time, within budget
- Deliver 9% of large projects on time, within budget
- Deliver large projects with 42% of original features
- Deliver small/medium projects with 78% of original features
- Restart 94% of projects at least once
- Average 18-24 months per medium project 3-5 years per large

# IT's going to get worse

- Agile Enterprise

- Numerous small/medium changes - 30 day window of opportunity
- frequent large changes with 6 month window of opportunity
- Li & Fung can put together an entire enterprise in as little as six weeks

- Innovation Enterprise

- weekly / monthly with significant innovations 4-6 times/year

# IT Must!

- Complete 50% of projects in 2-6 weeks, 35% in less than 4 months, 100% in less than 1 year.
- Cost 50% of projects at less than \$100K, 35% at less than \$500K, and 100% at less than \$1M.
- Directly map 100% of IT functionality to Business purpose with clear ROI.
- Reduce LOC by two (three?) orders of magnitude.
- Increase modularity by one order of magnitude.

# Revolution!



# Were We Went Wrong

- Formalism
- Metaphor Abuse (Physics Envy)
- Dualism
- Technology Lock-in

# Formalism



Descartes



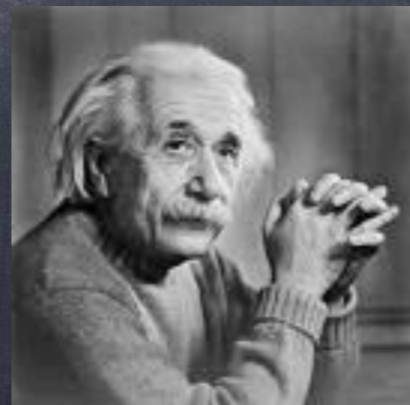
Leibniz



Newton



Kant



Einstein

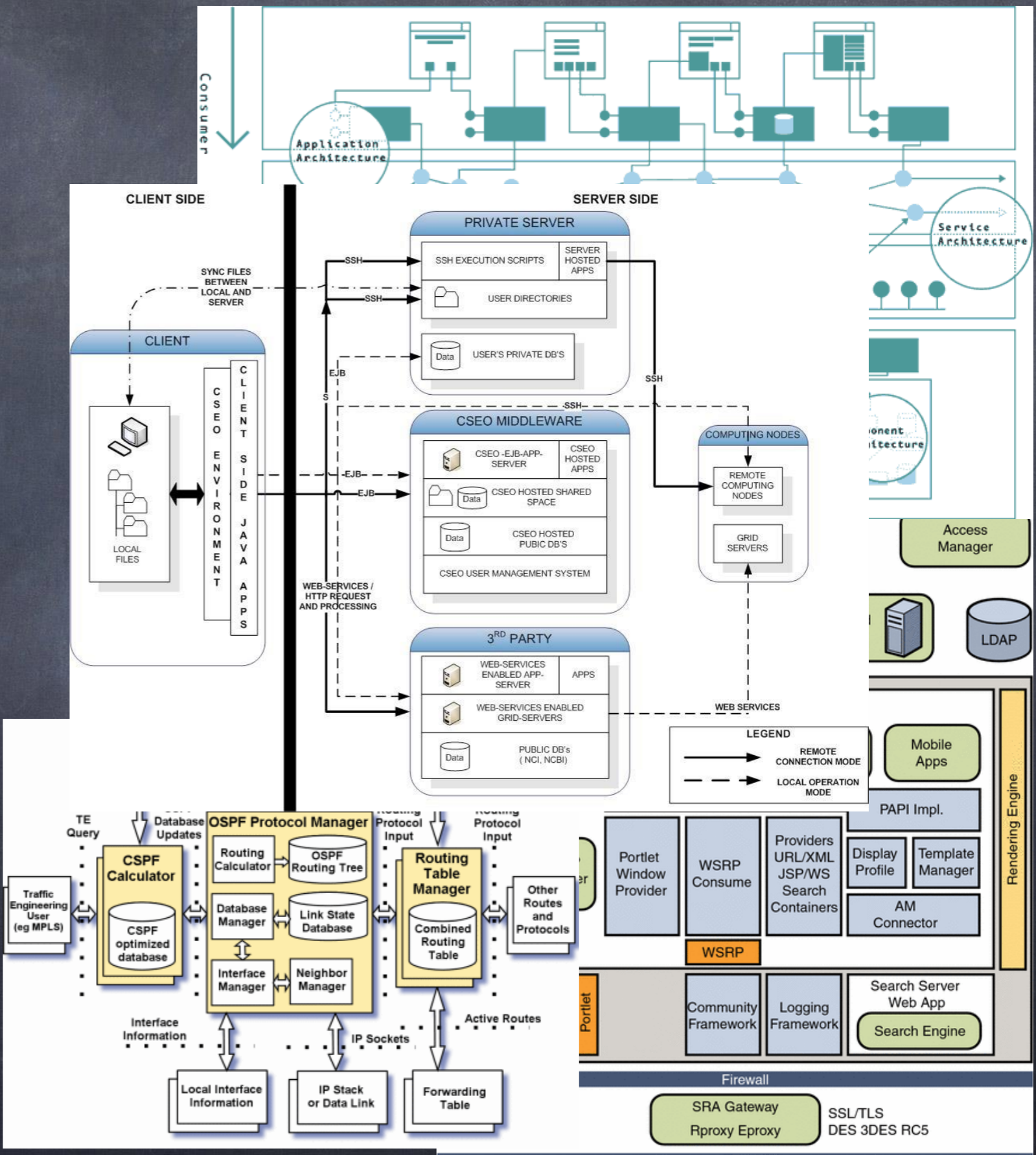


Pascal

# Metaphor Abuse - Clockworks



# Dualism



# Technology Lock-In



Legacy is a self-fulfilling prophecy - a myth - a ghost - a million-ton boat anchor



70-80% of the IT budget in large organizations is spent on maintenance!

# There is a Way

Objects

Monism

Design Thinking

EII

Craft

Whole Team

Thick Description

# One System



# Object Metaphor

*“Along the philosophical fringes of science we may find reasons to question basic conceptual structures and to grope for ways to refashion them. Old idioms are bound to fail us here, and only metaphor can begin to limn the new order.”*

W. V. O. Quine

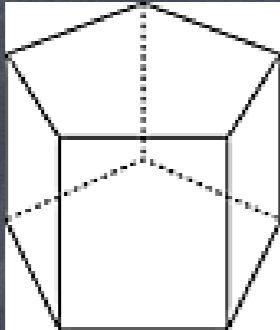
Objects are  
the modules  
of reality.

Objects are People!

Objects are Lazy.

Anthropomorphization is essential!

# Object Visualized



Class Name  
Description  
Stereotype

Responsibilities  
Collaborators

Knowledge  
Required

Message  
Protocol

Event  
Notifications

# Everything an Object

If you look inside of an object you should see other objects - as occupants of variables, a collection of variables, and a collection of methods (a method is an object) that respond to messages (a message is an object).

Fine Print: eventually you will leave the world of objects and enter the world of language primitives and machine instructions, even 1's and 0's. But don't do it until you are dragged kicking and screaming. Above all else - don't type!

If you look at the world around an object you should see nothing but objects - processes are objects, enterprises are objects, products are objects, services are objects ... there is nothing that cannot be conceptualized and visualized as an object.

Imagine a  
Brewery

# Thick Description

**thick description** describes behavior in a way that explains not just the behavior, but its context as well, such that the behavior becomes meaningful to an outsider.

A story describes an expected behavior of an object.

Aggregate stories to yield a thick description of the enterprise.

*“Programming properly should be regarded as an activity by which the programmers form or achieve a certain kind of insight, a theory, of the matters at hand ...*

*... theory is understood as the knowledge a person must have in order not only to do certain things intelligently but also to explain them, to answer queries about them, to argue about them, and so forth.*

*What has to be built by the programmer is a theory of how certain affairs of the world will be handled by, or supported by, a computer program.”*

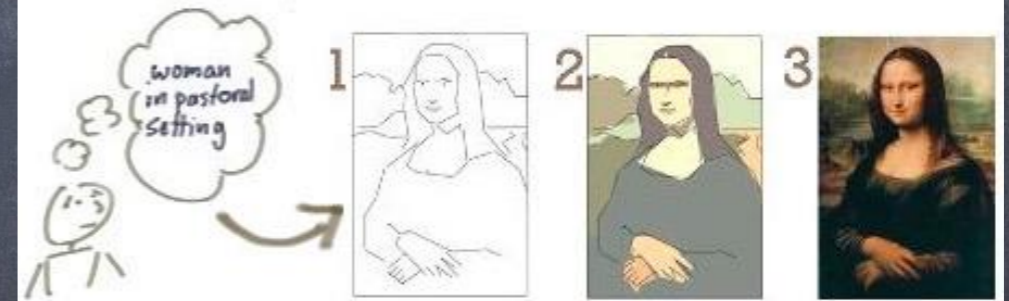
# En



## Incremental



## Iterative



Ethnographer

Designer

Synthesist

Ordinologist

Experience Architect

Storyteller

Set Designer

Engineer

Director

Whole

Caregiver

Team

Customer

Owner

Collaborator

Experimenter

Programmer

Tester

Hurdler

Cross-Pollinator

# Design

Design is like Chess.

Players start with a system in one state, envisage a different desired state, and devise a sequence of changes that transition from what is to what is desired.

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Design is like Chess.

On a board with no squares, played with pieces that can be invented or changed while the game is in progress, where the rules are variable depending on context, and the overall game objective is subject to change.

# Design Thinking

The Brief

Real Space

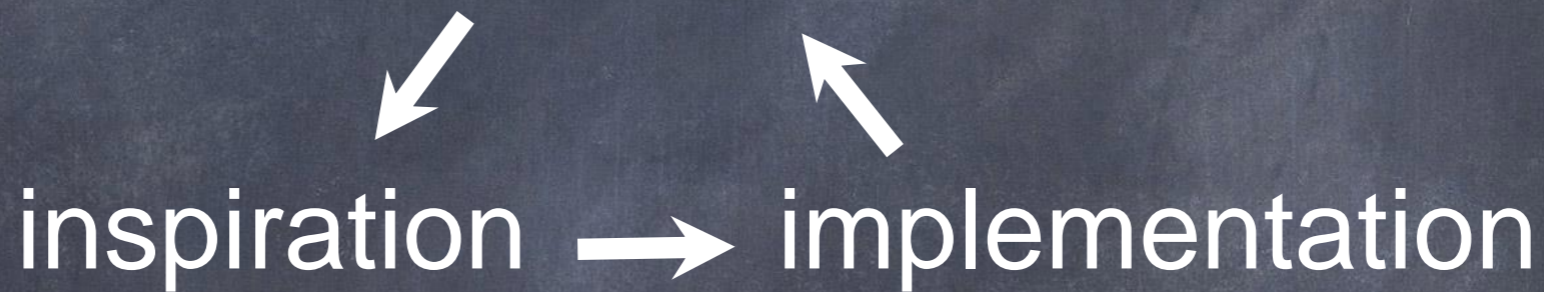
Prototype

Observation

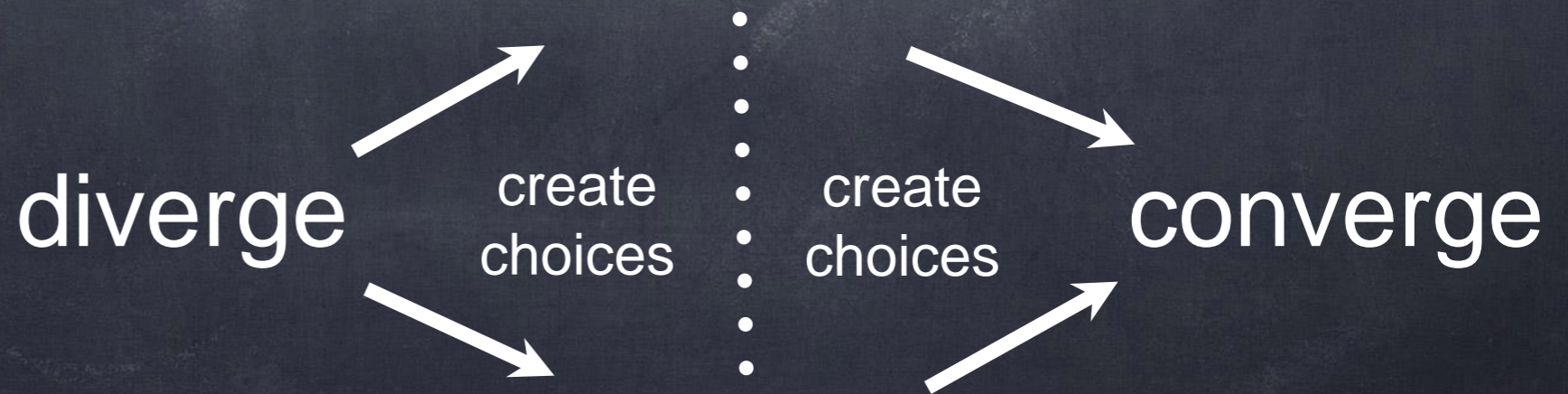
Empathy

Patterns

ideation



desirability  
feasibility  
viability



# Patterns Basic

Solution to a Problem in Context

Analysis  
Patterns

If Context is  
programming Language  
(implementation  
environment)  
it is NOT a Pattern

Pattern = Brief

# Patterns - Primeval

“We had to interpret relationships to survive ... understanding how basic patterns connect allows us to alter our experience ... we learned to symbolize ... recognizing patterns is one of humanities greatest abilities ... the basis of conscious awareness that that brings cohesion to a chaotic world by allowing us to see contrast as well as similarity ... pattern establishes a dynamic relationship that connects seemingly opposed, unrelated, or even invisible forces ... there are relatively few patterns that make up existence ... there are only a handful of basic shapes that combine in ways stable and efficient enough to be practical in three dimensional space ... sacred geometry ... “

Branching      Wholeness      Spiral  
Weaving      Helix  
Vortex      Meandering



# Craft Environment

Imagine...

...a studio in Renaissance Florence; a master and advanced apprentices; several arts being worked shoulder to shoulder - sculpture, painting, goldsmithing, even poetry - with masters for each; a spectrum of younger apprentices eager to master one art but eager also to learn another, or several. This the ideal of the bottega:

- a “storefront” where goods and services are produced and delivered to paying customers
- a workshop simultaneously engaged in the craft, in building the tools and discovering the techniques that advance and support the craft, and teaching that craft to apprentices
- a place noisy with multiple projects and activities; walls and benches covered with works in progress and exemplars of the craft
- a place filled with the tools of the craft.
- an intellectual center that is a “must visit” for masters, scientists, and thinkers visiting the area, overseen by local masters.
- an environment and atmosphere that is very self-consciously inter-disciplinary; that mixes theory and practice almost without differentiation
- a place full of music.
- a place to share food and drink
- a maelstrom of innovation and creativity

# "T" Shaped Crafter

## PROGRAMMING

Fundamentals  
 Program Architecture  
 Idiom & Standards  
 Algorithm Patterns  
 Data Structure Patterns  
 Design Patterns  
 Architecture Patterns  
 Smalltalk  
 Ruby  
 Java  
 Web / Javascript  
 Web Python  
 C++ / C#  
 LISP  
 Language Topic  
 Machine Programming  
 OS/Util Programming  
 Network Programming  
 Security Programming

## TESTING

Testing  
 Automated Testing  
 Test Frameworks  
 Regression Testing  
 Aformal Testing

## TEAMWORK

Fundamentals  
 Team Dynamics  
 Team Leadership  
 Scrum Master / Coach  
 Project Mgmt  
 Agile Project Mngmt  
 CIO - Executive Mgmt  
 Innovation Mgmt  
 Tech Transfer Mgmt  
 High Performance Orgs

## DESIGN

Principles of Design  
 Systems Design  
 Design Visualize I  
 Design Visualize II  
 GUI Design  
 Web Design  
 Software Components  
 Software Applications  
 Software Architectures  
 Interaction Design  
 Experience Design  
 Visual Quant Info (Tuftte)  
 Complex Systems Design  
 Enterprise Design  
 Dynamic/Emergent Design

## COMMUNICATIONS

Professional Comm Srvy  
 Reading for Pleasure  
 Writing for Pleasure  
 Reading for Purpose  
 Writing for Purpose  
 Documentation  
 Manuals  
 Proposals  
 Presentations  
 Big Visible Charts  
 Quant / Qual Info  
 Instructional Material  
 Refereed Paper  
 Monograph

## DATA

Data, Info, Knwldg, Wisdom  
 Domain Info Modeling  
 Data Mgmt / Persist  
 DBMS  
 Alternative DBMS  
 Info Sciences  
 Search  
 Data Representation  
 Knowledge Mgmt

## THINKING

Scientific Thinking  
 Metaphoric Thinking  
 Introspection  
 Reflection  
 Meta-Protocols

## APPLICATIONS

Application Dev  
 Systems Dev  
 Applets  
 Task Automation  
 Desktop Apps  
 Client-Server  
 Networked Apps  
 Simulations  
 Mobile Apps  
 Embedded Apps  
 Agent-based Models  
 Ambient Comp  
 Complex Systems  
 Ubiquitous Comp

## MATHEMATICS (2 cr)

Algebra Foundations  
 Geometry Foundations  
 Trigonometry  
 Algebraic Equations  
 Functions  
 Differential Calculus  
 Integral Calculus  
 Matrices  
 Differential Geometry  
 Graphs / Networks  
 Probability  
 Statistics  
 Linear Equations  
 Vector Calculus  
 Topology  
 Dynamical Systems  
 Chaos Theory  
 Group Theory  
 Order Theory

## PHILOSOPHY

Themes - Western  
 Themes - Eastern  
 Metaphysics  
 Epistemology  
 Phil of Science  
 Phil of Technology  
 Phil of Business  
 Hermeneutics  
 Postmodernism

## METHODS / TOOLS

Developer Tools  
 IDE's  
 Collaboration Tools  
 Method Support Tools  
 Methodology  
 Method Survery  
 Classical Methods  
 Agile Methods  
 Agile Embellishments

## SCIENCES

Scientific Method  
 Scientific Experiment  
 Scientific Theory  
 Geography Fndtns  
 Quatitative Geography  
 GIS Basics  
 GIS applications  
 Foundations  
 Ecology Intro  
 Computing Biology  
 Cells / Agents  
 Evolution  
 Ecosystems  
 Emergence  
 Einstein  
 Quantum Theory  
 Quantum Computing

## HISTORY

Historiography  
 History of Science  
 History of Technology  
 History of Computing

## SOCIAL SCIENCE

Culture  
 Ethnography  
 Corporate Culture  
 Innovation Culture  
 Fostering Micro-cult  
 Fostering Entrprs-cult

## ART / HUMANITIES

Creativity  
 Creative Expression  
 Draw / Draft  
 Philosophy of Music  
 Instrument -Perform  
 Instrument -Perform  
 Instrument -Perform  
 Instrument -Perform

## Health / PE

Fitness / Health  
 (Yoga/Tai Chi) I  
 (Yoga/Tai Chi) II  
 (Yoga/Tai Chi) III  
 (Yoga/Tai Chi) IV  
 (Judo) I  
 (Judo) II  
 (Judo) III  
 (Judo) IV

## BUSINESS

Enterprise Theory --- Enterprise History --- Management Theory --- Management History --- Accounting View  
 MRP View --- Finance View --- Technology View --- Marketing View --- Entrepreneurship --- Blaw  
 Regulation --- Taxation --- Business Strategy --- Business Tactics --- Governmental Relations  
 International Relations --- Reporting Rqmnts --- Ext-structures --- Virtual Organization --- Tech Transfer I  
 Innovation Mgmt I --- innovation Mgmt II --- Tech Transfer II

## PROJECTS (4 cr)

Acclimation II --- introductory I --- Introductory II --- Intermediate I --- Intermediate II --- Advanced I --- Advanced II  
 Enterprise --- Research --- Mastery --- Advanced Research

# Transcendence

How do you live your life, oh Enlightened One?

When hungry, eat; when thirsty, drink; when sleepy, sleep.

## BAN THE PROJECT!



## Perpetual Revolution

# Let's Do Lunch



Questions? Comments?

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