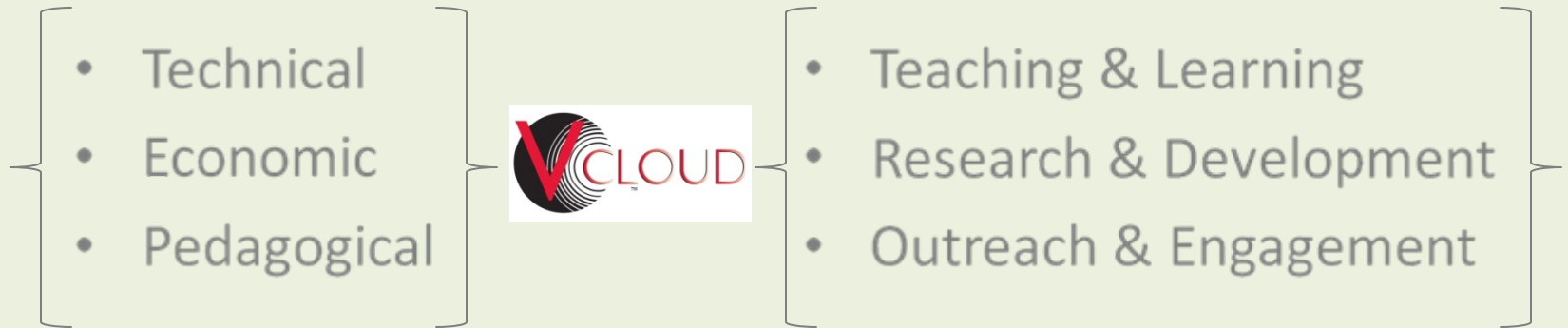


# VCL

## Virtual Computing Laboratory *An Opportunity to Lead*





# Avoiding Crisis-Creating Success

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- Silo'ed Investments
- Complexity
- Access
- SaaS
- Borg “*like*”



# IT Timeline

## Three Foundational IT Elements

Communications

Information

Manipulation

Information Age Timeline →

1960

1980

1990

2000

2010

Network

Web

Cloud Computing

Evolution of User Capability [*Abstraction Layer*]

**Tipping Point**



# Economic Climate

## The Worst of Times

- Education has diverse requirements
- Learning requires a technology rich environment
- Historical responses are unworkable
- Behaviors foreshadow outcomes
- Improvement depends on analytics

Enrollment ↑  
Expectations ↑  
Funding ↓

Risk ↑  
Crisis  
Opportunity ↓

## The Best of Times



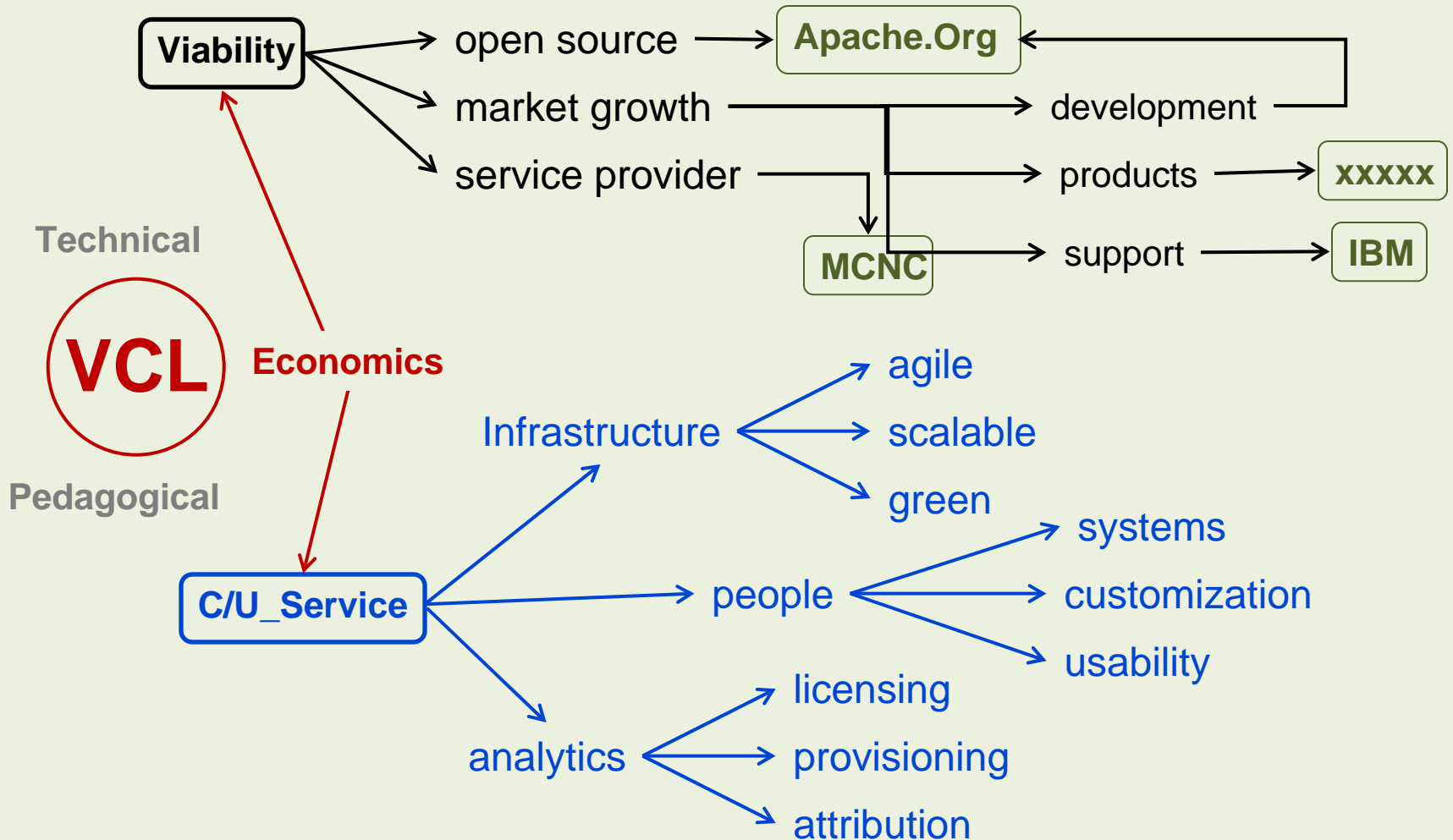
# What is VCL?

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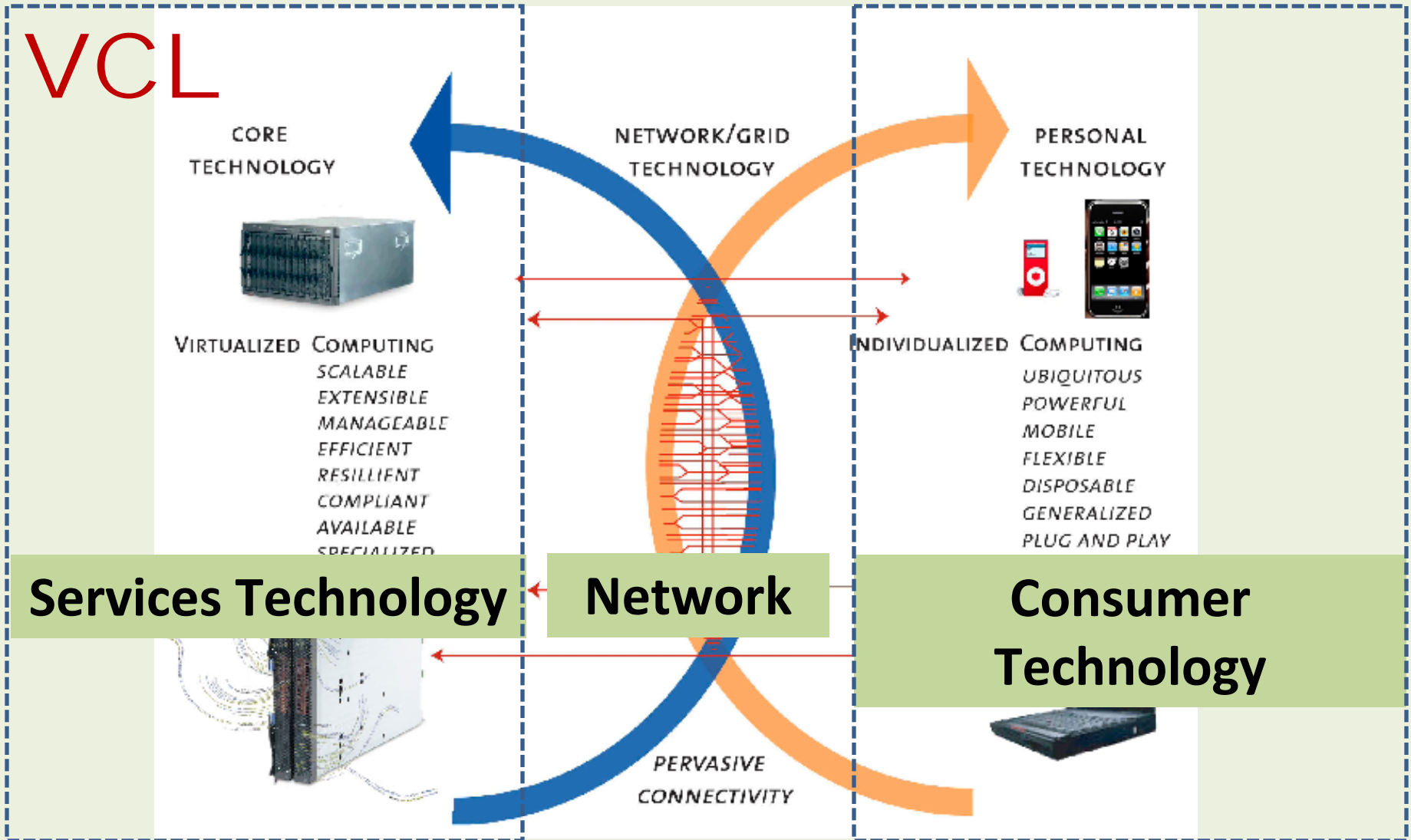
## VCL

- Is a management, hardware and software **system** that provides for automated re-configuration, reuse, multiuse and leveraging of IT resources for flexible, on-demand access.
- Is a software as a service model (SaaS) of **cloud computing**, where computing performed elsewhere delivers a “cloud” of services to your device.
- Is a **development initiative** undertaken to avert crisis; i.e., to resolve technical, economic and pedagogical barriers to effective access and use of computing technology in learning and research

# Business Case

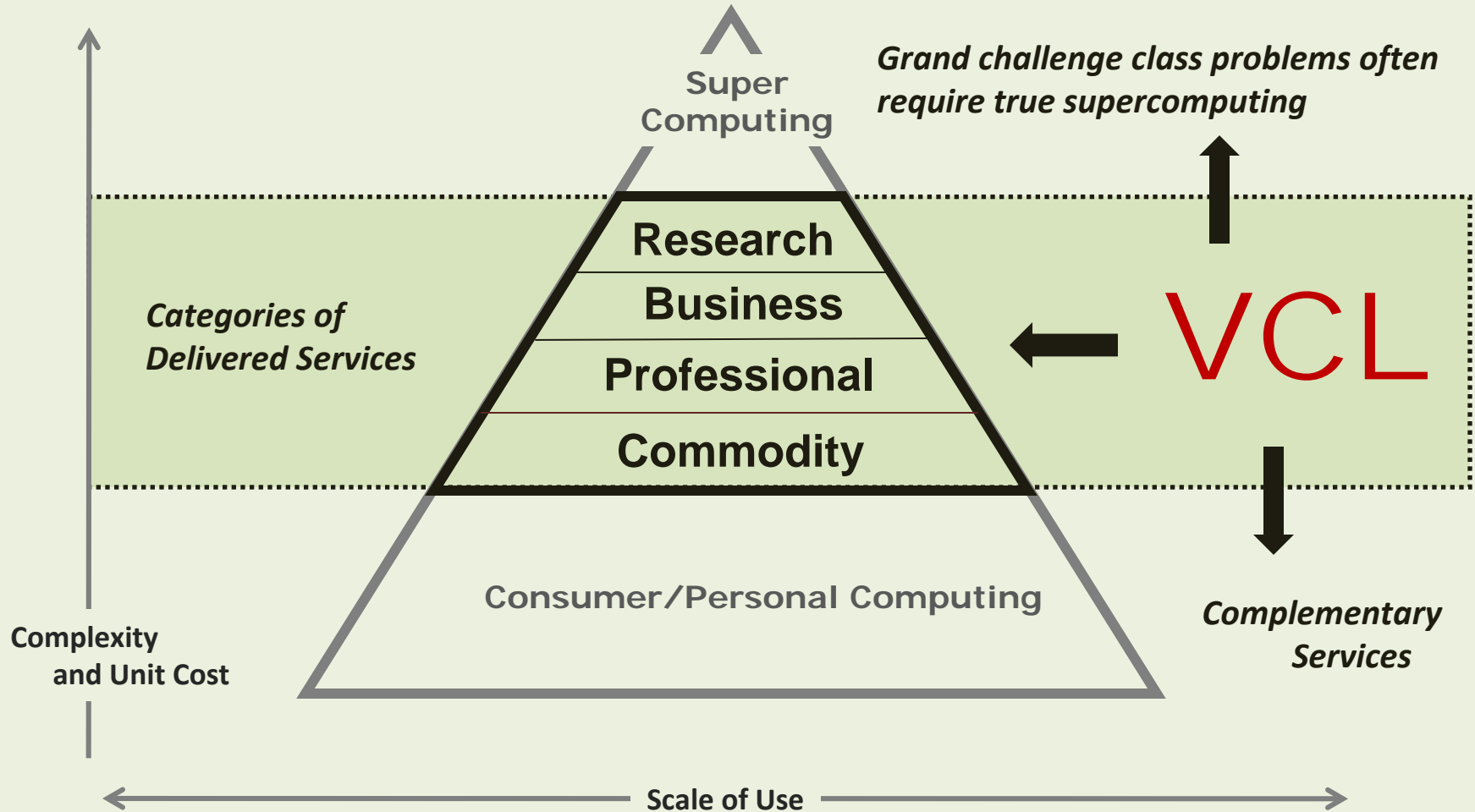


# Service Paradigm





# Service Environment

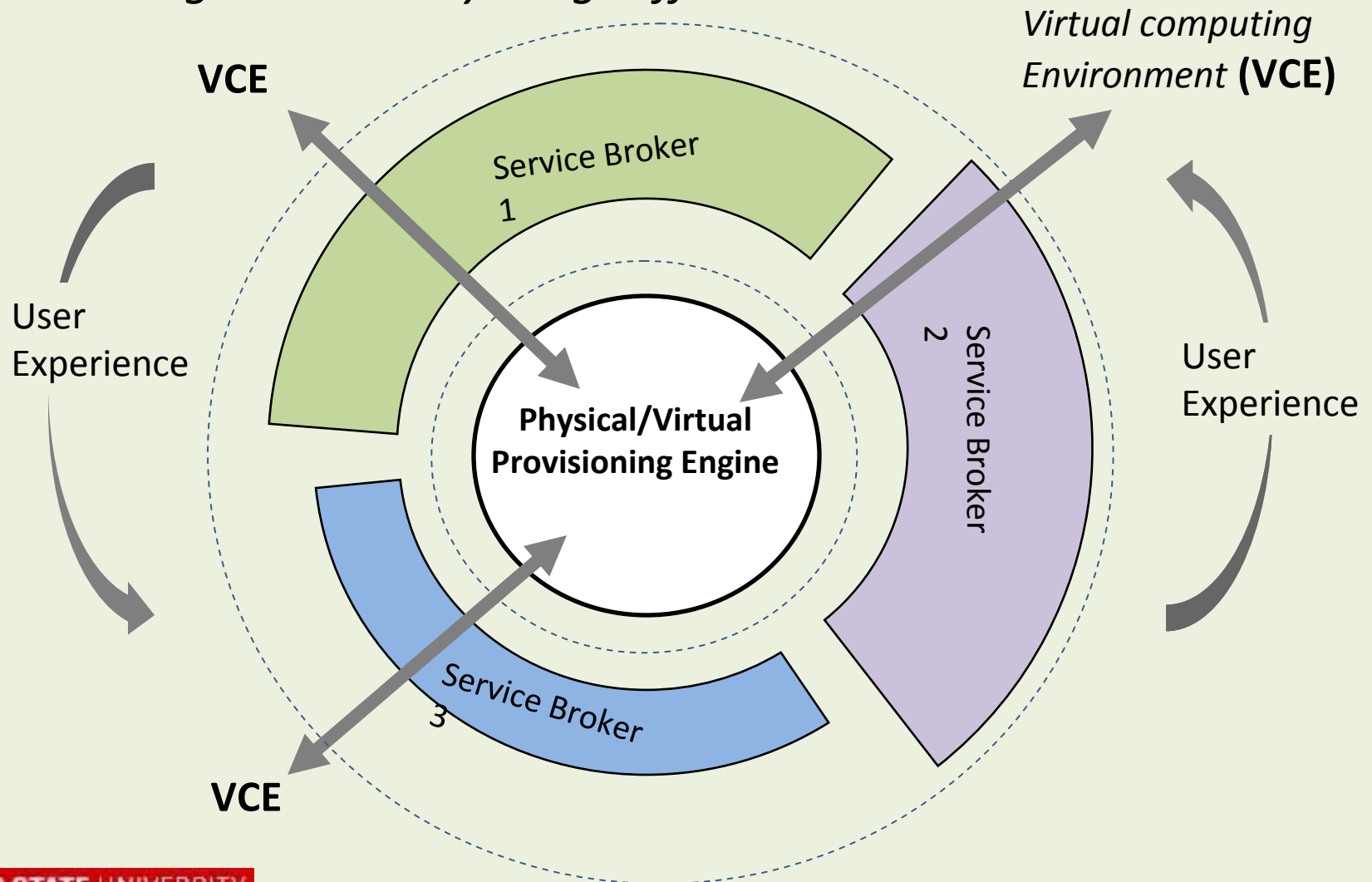






# Underlying Architecture

*Nothing New—Everything Different*





# Why VCL Works as a Solution

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## VCL is Counterintuitive

- VCL delivers the economic **benefits of infrastructure consolidation** while enabling an unprecedented level of **user control and service diversity**.
- VCL **advances aspirational goals** while **leveling the playing field** across services ranging from theoretical research and innovation, to basic commodity tools.
- VCL delivers **service specific solutions** from a single shared, leveraged architectural framework that dynamically **adapts to user demand**.



# VCL in Action

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1. **Mainstreams special, hard to support capabilities** — allows CS students to modify, even crash, “servers” with impunity. Intelligent Pipelining, DR and BC.
2. **Broadens access to complex and costly apps** — HPC, SAS w/ArcGIS....a threshold investment anywhere lowers the barrier to entry everywhere.
3. **Provides hassle-free repeatability** — faculty have switched from traditional solutions to VCL to bypass local support challenges.
4. **Leverages underutilized capacity across disparate uses** — shifting resources between student computing and HPC. Also virtualization.
5. **Maximizes student investment, promotes safety, accommodates lifestyle, is green** — time, place, platform independence.
6. **Empowers innovation, experimentation** — allows custom software builds, custom configurations, and runtime control (virtual ownership) .
7. **Facilitates analytics-based resource management** — you can't manage what you can't measure. Think software, power, capacity, etc.