



Distributed Cognition as a Solution to High Performance Computing Customer Support

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Topics of Consideration

- **Shared Knowledge and Distributed Cognition**
- **Technical Cooperation**
- **Motivation to Develop Community**
- **Coordination of Information**
- **The Model for Sandia National Laboratories**
- **Recommendations for Future Developments**



Shared Knowledge and Distributed Cognition

A definition:

- **Human cognition is not solely possessed or residing in the mind of an individual**
- **It is the result of people thinking in conjunction or partnership**
- **Social, historical, physical, artifactual**
(Gaveriel Salomon, 2001)



Shared Knowledge and Distributed Cognition

Enabling Shared Knowledge:

- **Social processes should be treated as cognitions**

(Resnick, 1981)

- **Tools are artifacts of distributed intelligence**
- **The community members using tools define the activity**

(Pea, 2001)



Technical Cooperation

- **Online technology may be used to exploit economies of cooperation through online exchange of information:**
 - **Gifting**
 - **Nonrival**
 - **Nonexcludable**

- **Challenges posed:**
 - **The need to motivate contributors**
 - **Coordinating the information**

(Kollock, 2004)



Motivation to Develop Community

- **Social Dynamics**
 - People will access a site online for the information; they will return for the community
- **A site should provide:**
 - Design for change
 - A way to exchange feedback
 - Give members the power to contribute to the information

(Kim, 2000)



Coordination of Information

- **Knowledge Management**
 - **Security**
 - **Should not Distract the User**
 - **Quality Control**

- **Knowledge Management Tools**
 - **Must be familiar to the user**

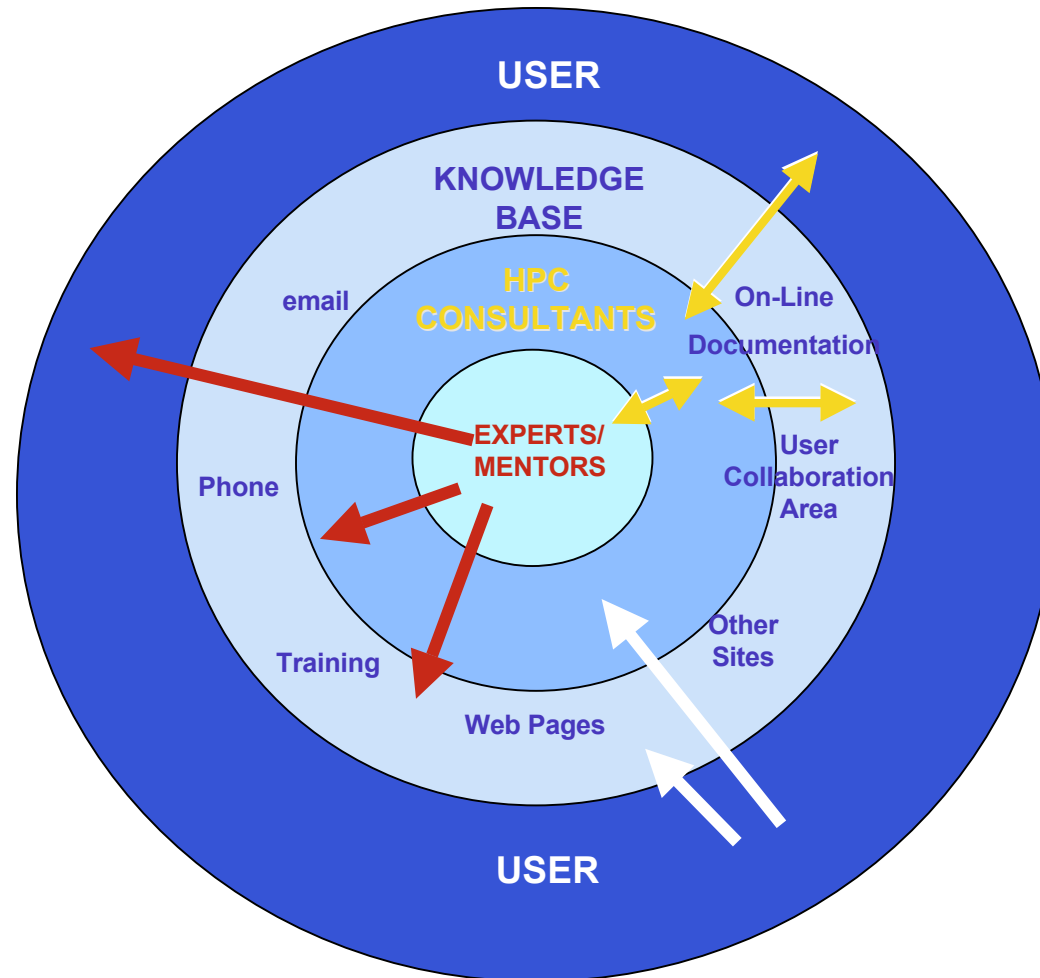


CLIK: Collaborative Learning, Information, and Knowledge

- **Specific Needs of the HPC Environment**
 - **Dynamic Landscape**
 - **Customers are the Experts**
 - **Problem Solving Requires Research**
 - **Support must be interoperative**
 - **Access to timely information**
- **Academic Framework**
 - **FOCAL (Gunawardena, et al, 2003)**
 - **Minimalist (J.M. Carroll, 1998)**
 - **Flow (M. Csikszentmihaly, 2000)**



CLIK Model for HPC Technical Support





CLIK: Collaborative Learning, Information, and Knowledge

- **SocioTechno Community**
 - **Goal to create a culture of shared information gathering and exchange**
 - **Construct Technical Knowledge through Social Collaboration**
- **Design based on:**
 - **Collection**
 - **Dissemination**
 - **Management**




CLIK

- **Motivation**
 - **Novice can find the information that they need to get started**
 - **Experts can collaborate**
 - **Anyone can contribute**
 - **Manages information**



The Interface



ASC High Performance Computing On-line:
Selection... ▾

- Analyst Information
- Calendar
- Collaboration Area
- Code Optimization
- SARAPE
- Training

Find Information in the Knowledge Base Community:
Search CLIK Knowledge Base
Search Submittals Only*
**Search limited to Knowledge Base submittals.*

Add to the CLIK Knowledge Base:
Knowledge Base Submittal

Need technical assistance?
Technical Assistance Request

Provide Technical Assistance and Track Requests:
TAR Administration

Note: CLIK is for Unclassified Information Only.

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Where do we go from here?

- **Build it and they will come. Let them add on and they will stay!**
- **Encourage community building**
 - **More collaboration tools**
 - **Member identity - Wiki**
- **Make changes as the system evolves and the needs change**



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- **Comments, questions, lunch**