Information Technology Practitioner Skills in Europe: Current Status and Challenges for the Future

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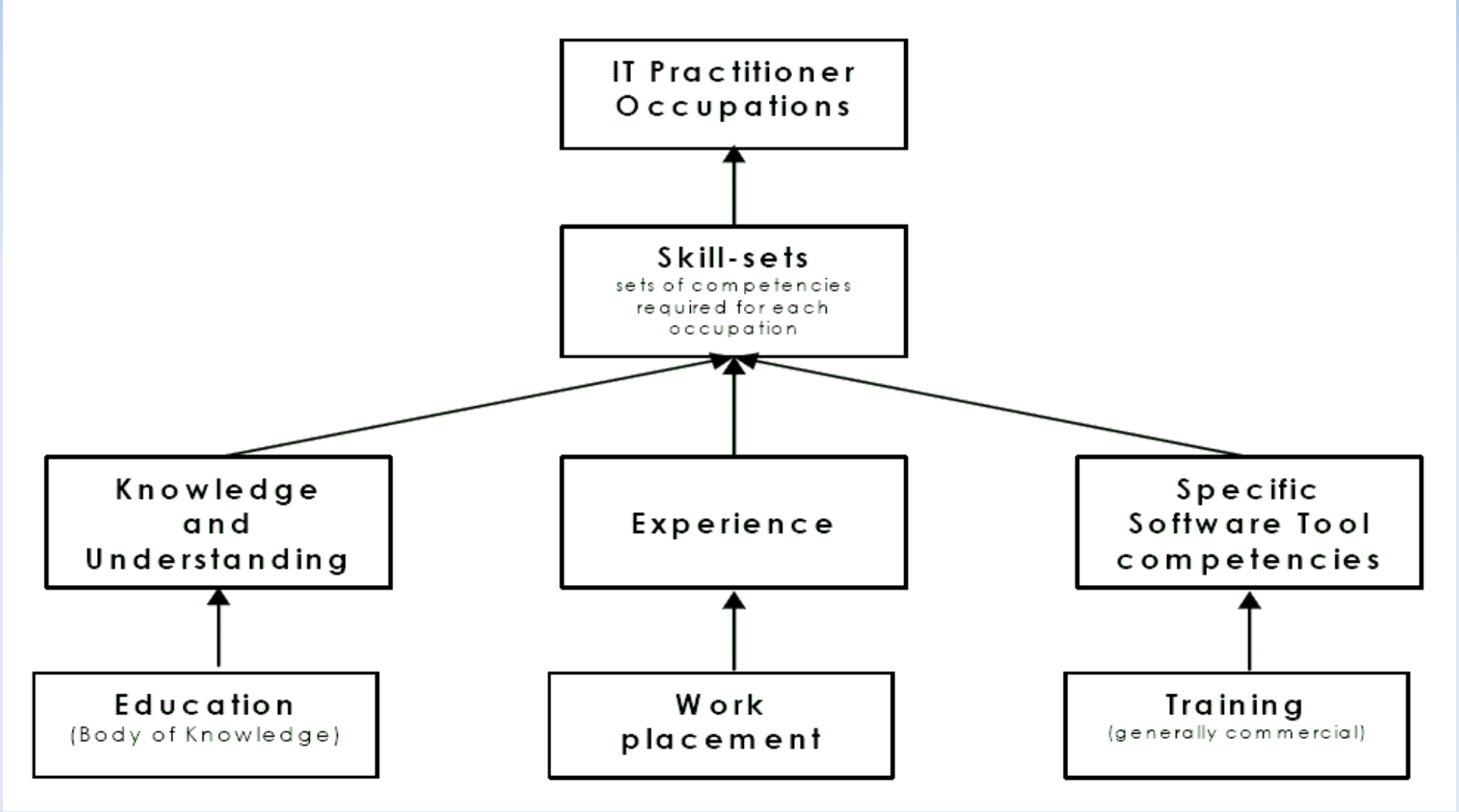
IT “skills gap”

- Exact nature of the problem
- Perspectives:
  - Political
  - Economic

Terms

- Skills
- Occupations
- Competencies
- Education
- Training
- Continuing Professional Development

Terms cont.

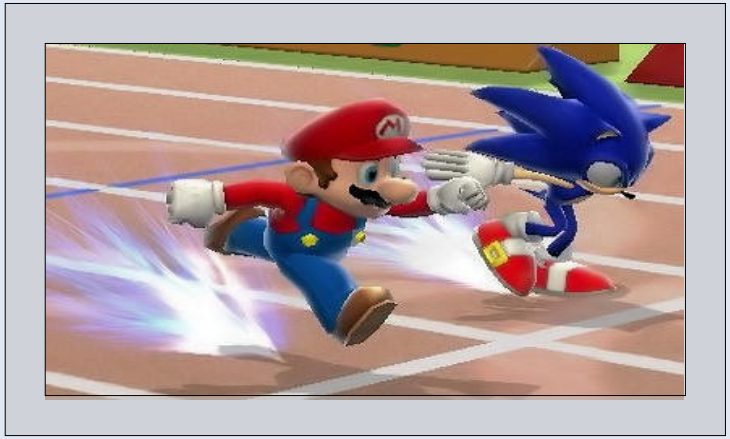

IT Practitioner Occupations
Skill-sets
sets of competencies required for each occupation
Knowledge and Understanding
Experience
Specific Software Tool competencies
Education
(Body of Knowledge)
Work placement
Training
(generally commercial)

CEPIS

- The Council of European Professional Informatics Societies
- Non-profit organisation
- 34 (36) European national member societies
- 29 (34) countries of Europe
- More than 200,000 IT professionals

CEPIS cont.

- Goals:
  - Employment
  - Competitiveness of business
  - Quality of life of all citizens



CEPIS cont.

- Proposals
  - EISS (European Informatics Skills Structure)
  - Information Technology Practitioner Skills
  - ECDL
  - EUCIP

ECDL

- European Computer Driving Licence
- ICDL (International CDL)
- 148 countries
- Developed 1996
- International Standard
- A test of practical skills and competencies

EUCIP

- European Certificate for Informatics Professionals
- Defines a core knowledge for IT professionals
- The overall goals of EUCIP are:
  - To define an industry-driven standard for Informatics professionals.
  - To meet the demands of the increasing market for IT professionals across Europe.
  - To contribute to closing the IT skills gap in Europe.
  - To offer a vehicle for life-long learning and competency enhancement for the IT profession.

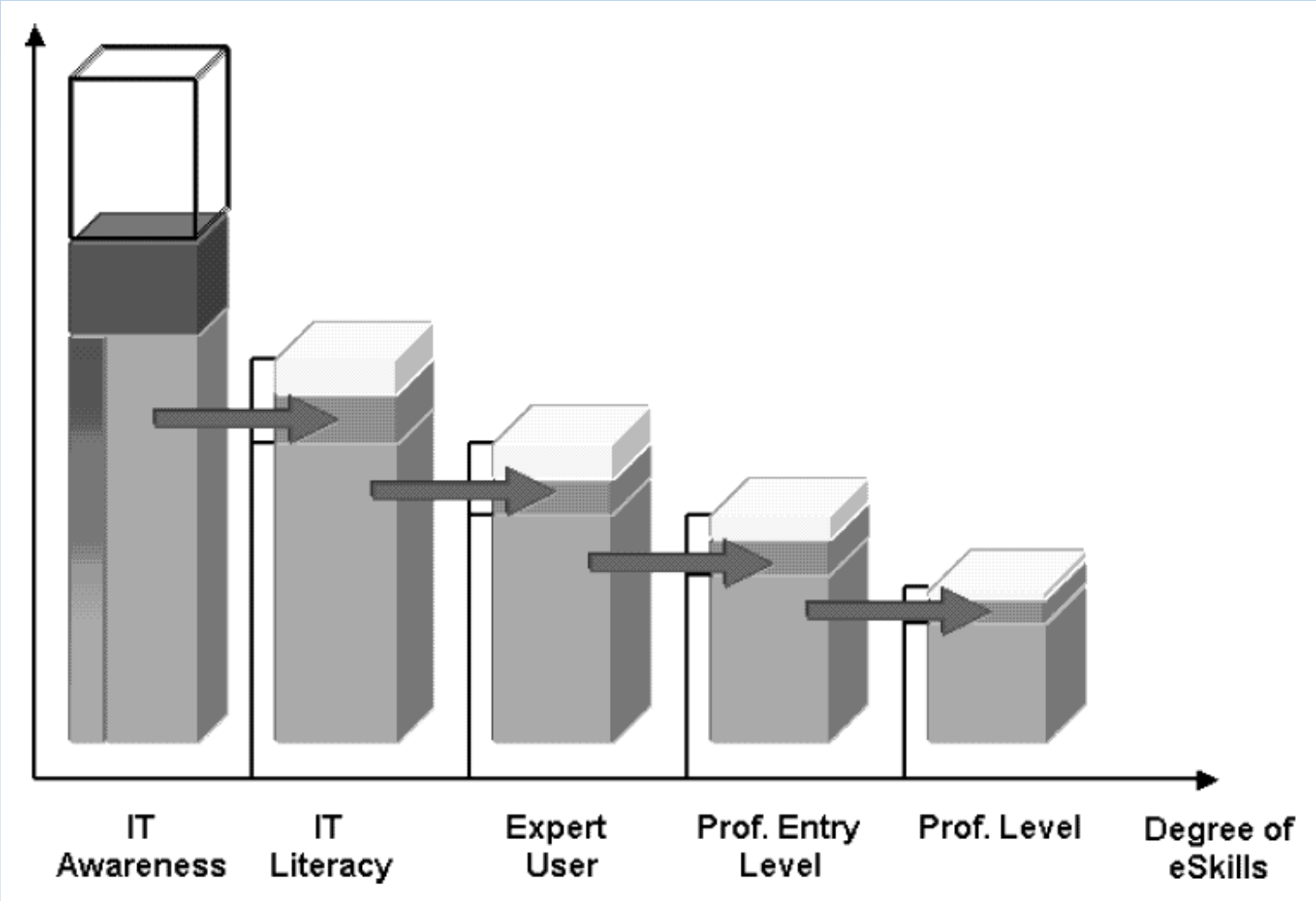
Competence Maturity Level

- A new framework (CEPIS)
- Stages of professional competence (IT):
  - IT Awareness (ECDL)
  - IT Literacy
  - Expert User (EUCIP)
  - Professional Entry Level
  - Professional Level

CMM cont.


employed people
unemployed people
skills gap
IT Awareness
IT Literacy
Expert User
Prof. Entry Level
Prof. Level
Degree of eSkills

CMM cont.


IT Awareness
IT Literacy
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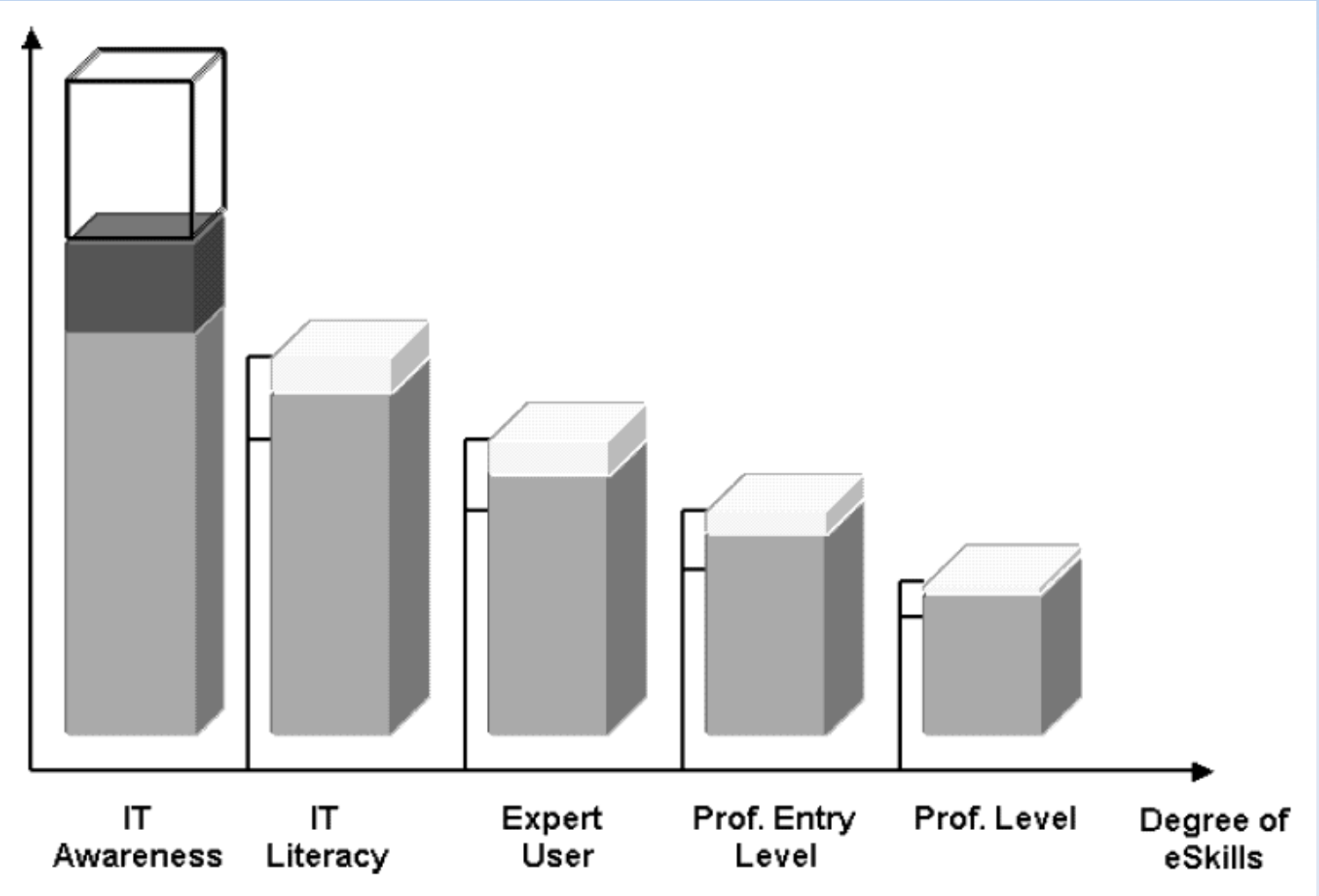
CMM cont.


IT Awareness
IT Literacy
Expert User
Prof. Entry Level
Prof. Level
Degree of eSkills

Summary

- CEPIS is ready to further strengthen its contribution to tackling the problems (for example skill shortages)
- The Truth (IT Practitioner) Is Out There

Collaboration via Internet and Web

Ivan Tomek

Background

- The Web is too document and data-centric
- The Web is asynchronous
- A need for social interaction & collaboration
- Web paradigm the *Inhabited Web*

History

- Computer networks – made it possible to run programs on remote computers
- Internet – interconnect networks
- E-mail good for collaboration
- No good way to share documents
  - Berners-Lee created World Wide Web
  - HTML/HTTP
  - Document format separated from application

History cont.

- Development of web servers and browsers
- Limitations in HTML
  - No semantic structure
  - No built-in mechanism for extension
- Semantic Web
  - XML & XML Schema
  - XHTML
  - Web services – SOAP, WSDL, UDDI

History cont.

- History of web – document and data-centric
  - Also used for social interaction and collaboration
- Platforms for interaction & collaboration
  - Isolated and ad hoc
  - Platform-dependent
  - Application and document dependent

Requirements for social interaction

- E-mail and newsgroups – asynchronous
- Talk and Chat programs – synchronous
- Powerful tools but *isolated*
- Complete collaboration framework
  - Support real-world facilities

Features of a Virtual World

- Features
  - Persistence
  - Complete representation of inhabitants (agents)
  - Ability for agents
    - create & remove groups/places
    - create, access, share, modify artifacts
    - create & extend shared tools
    - Mobility – agents & tools
    - Security

Existing models

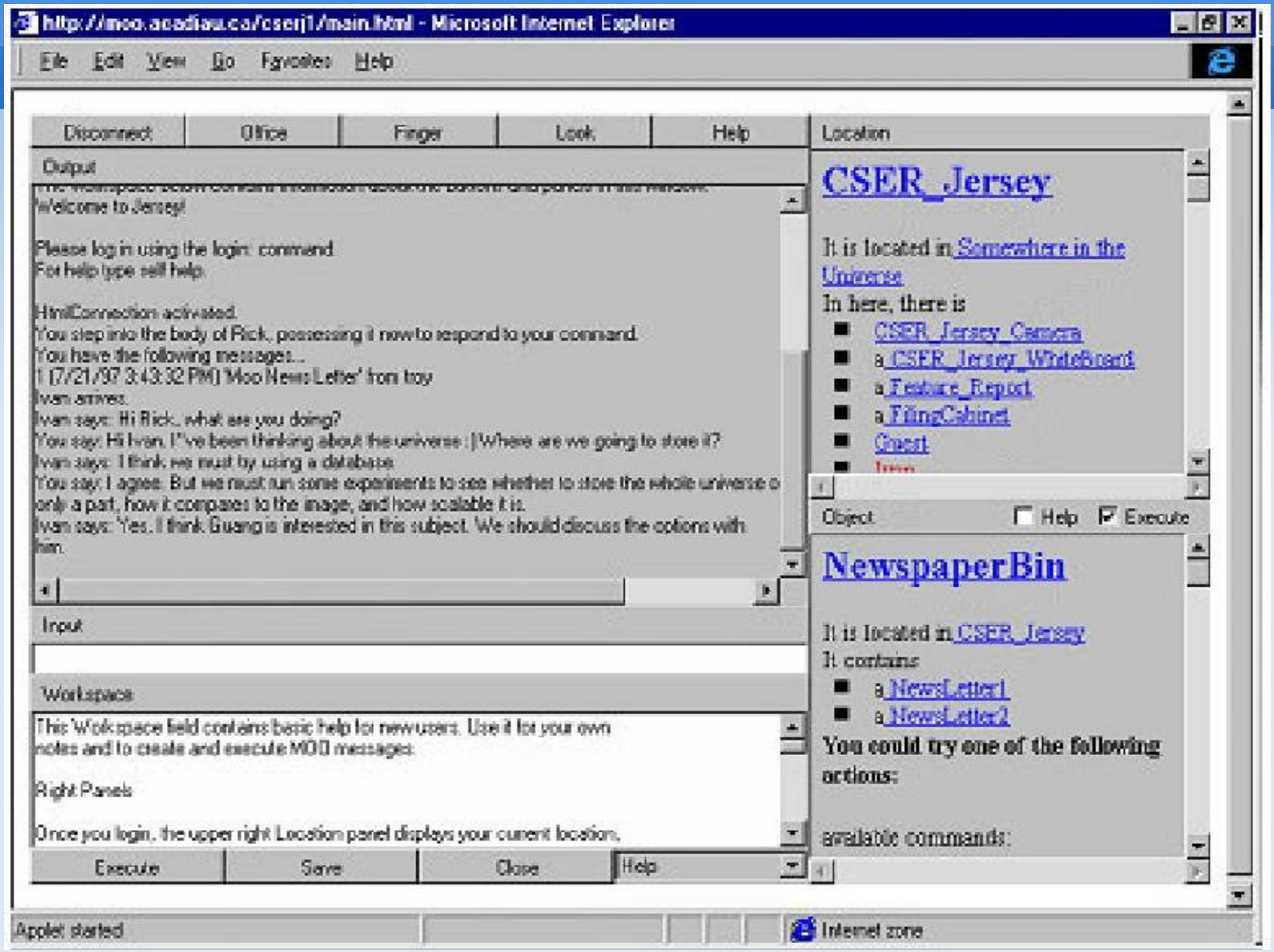
- MUD (Multi-User Dungeons/Diaglogs)
  - Created in the late 1970s
  - Emulated fairytale fantasy worlds
  - Client/Server – telnet
  - Evolved – Object oriented (MOO) and web GUI
  - Includes most of the features from previous slide
- VRML & X3D (XML-based)
- Growing commercial interest
  - Virtual Environments & Collaborative VEs

Classification of VEs

- Three categories
  - VEs using a universe built on modules with text or GUIs
  - VEs using a universe built on modules with 3D-graphics
  - VEs using graphics to model the universe as a continuum
- Technical issues – scalability/complexity
- Use – spatial requirements
- Conceptual model (MOO & 3D) - PBCE

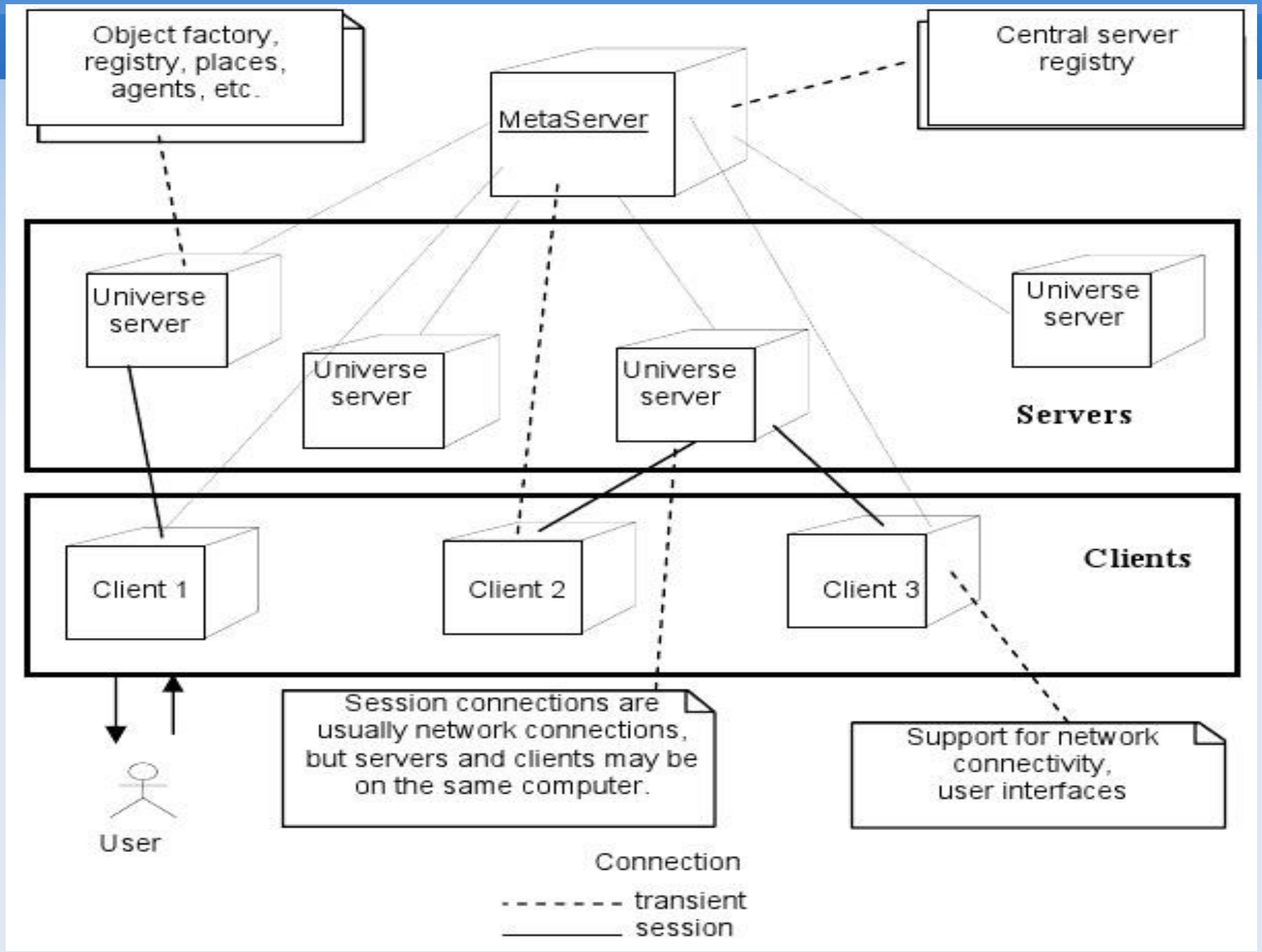
Three examples of CVEs

- Jersey MOO
  - Authors first project
  - Explore the suitability of the MOO concept
  - Geographically dispersed Smalltalk programmers
  - Telnet -> Web GUI
  - Human and software agents, different places
  - MOO-objects – documents and links
  - Ability to create new functionallity
  - Not event-aware


http://moo.acadiau.ca/cserj1/main.html - Microsoft Internet Explorer
File Edit View Go Favorites Help
Disconnect
Office
Finger
Look
Help
Location
Output
Welcome to Jersey!
Please log in using the login: command
For help type: self help
HtmlConnection activated.
You step into the body of Rick, possessing it now to respond to your command.
You have the following messages...
1 [7/21/97 3:43:32 PM] 'Moo News Letter' from toy
Ivan arrives.
Ivan says: Hi Rick, what are you doing?
You say: Hi Ivan, I've been thinking about the universe :) Where are we going to store it?
Ivan says: I think we must by using a database.
You say: I agree. But we must run some experiments to see whether to store the whole universe o
only a part, how it compares to the image, and how scalable it is.
Ivan says: Yes, I think Guang is interested in this subject. We should discuss the options with
him.
CSER_Jersey
It is located in Somewhere in the Universe
In here, there is
CSER_Jersey_Camera
a CSER_Jersey_WhiteBoard
a Feature_Report
a FilingCabinet
Guest
Object
Help
Execute
NewspaperBin
It is located in CSER_Jersey
It contains:
a NewsLetter1
a NewsLetter2
You could try one of the following actions:
available commands:
Input
Workspace
This Workspace field contains basic help for new users. Use it for your own
notes and to create and execute MOO messages.
Right Panels
Once you login, the upper right Location panel displays your current location,
Execute
Save
Close
Help
Applet started
Internet zone

Three examples of CVEs

- MUM (Multi-Universe MOO)
  - Authors second project
  - Developed in Smalltalk
  - Arbitrary number of interconnected universes
  - Multi-layered architecture
  - Meta-servers – registration and discovery of universes
  - Event-aware and pluggable UI
  - GUI-based and does not use a Web browser


Object factory, registry, places, agents, etc.
MetaServer
Central server registry
Universe server
Universe server
Universe server
Universe server
Servers
Client 1
Client 2
Client 3
Clients
Session connections are usually network connections, but servers and clients may be on the same computer.
Support for network connectivity, user interfaces
User
Connection
transient
session

Three examples of CVEs

- CVW (Collaborative Virtual Workplace)
  - A study of recent work
  - MOO-like environment
  - Developed at MITRE corporation and used in several military and government applications
  - GUI-based (not web)
  - Allows audio and video conferencing, shared whiteboard and documents in several formats

Conclusion

- Experience
  - Jersey & MUM
  - CVW
  - PBCE conceptual model is a good foundation for social interaction and collaboration
- Together with Web standards
  - *The inhabitated Web (IW)*