

Knowledge Structures and R&D Productivity

Basis for a Moving Forward...

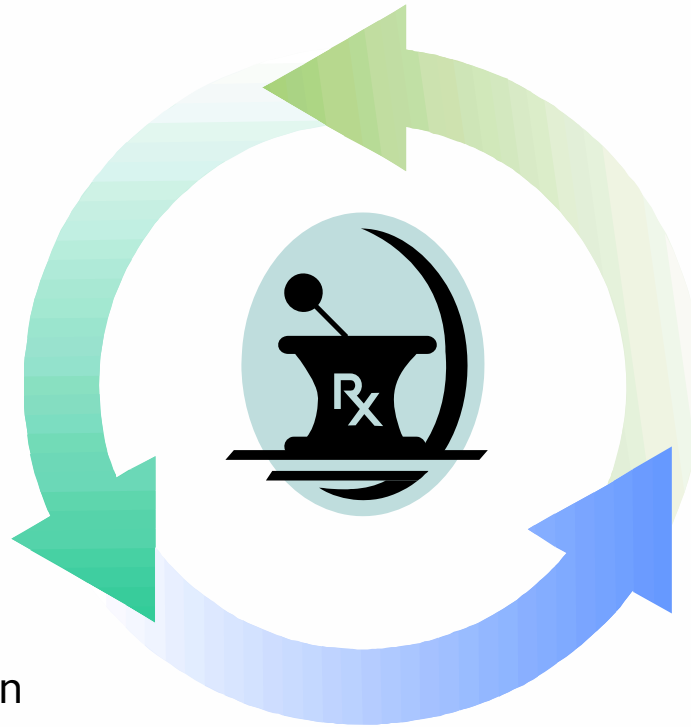
Current R&D strategy not meeting expectations

Scientific

- Poor and declining R&D productivity
- Lack of innovative products
- Inability to leverage success and learn from failures

Organizational

- Talent Exodus
- Declining job satisfaction



Environmental

- High attrition rate in late stage trials
- Continued focus on blockbuster drugs

Regulatory

- Increasing pressure to better predict and assess product safety focus

Pharmaceutical R&D is a knowledge industry

- High cost of pivotal trials makes the knowledge investment into Proof of Concept extremely important
- The number of targets (possible causes of diseases), weapons (therapies) with which to attack them, and novel approaches for identifying new potential causes and cures has exploded
- Pharmaceutical have spent tremendously on alliances and relationships to acquire technologies or tools to generate mountains of data

Knowledge needs are complex

- Deep and persistent uncertainty due to limited knowledge and experience with human biological systems and processes
- New hypotheses and findings must constantly be evaluated, and decisions must be made about which options to pursue and which to discard
- Mistakes are common because scientists and clinicians are constantly working at the edge of scientific and clinical knowledge
- Much of the knowledge of the diverse disciplines involved in drug development is intuitive or tacit ... leveraging collective learning is not a matter of checklists and best practices
- While technologies for identifying new potential causes and cures has exploded, knowledge about many of these signals remains superficial, forcing scientists to engage in more trial and error, not less

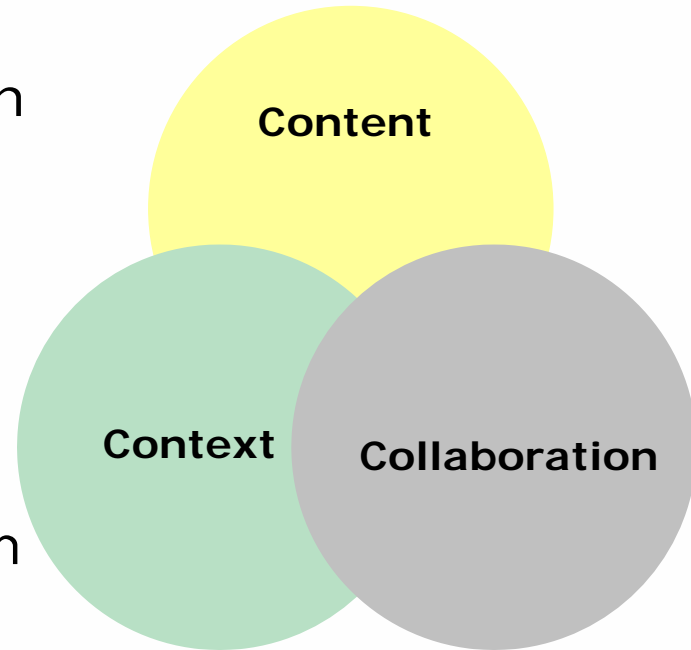
Past attempts at knowledge management unsatisfactory

- The Pharmaceutical industry has reaped little in return from massive investments in technology over the last 10 years
- There is evidence the current overload of data is actually hurting R&D productivity
- Major Knowledge Management and expert systems from the last 5-6 years have ended up sitting on shelves

...Having more databases is not the answer

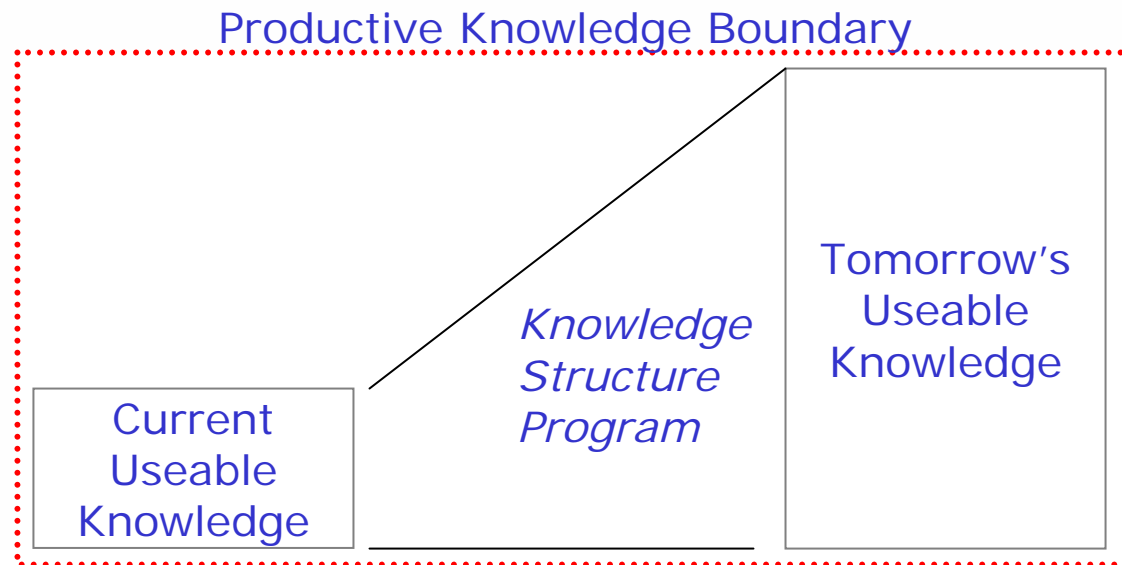
Past attempts neglected the structure of R&D knowledge

- Much useful knowledge is implicit (and cannot be made fully explicit)
- Lack of a robust process for leveraging internal knowledge to gain access to external knowledge
- Lack of understanding on how to prepare for innovation (which by definition is unexpected)
- Inability to maintain usage of team-based knowledge (e.g., learning from failure)
- Actions turn into learning that, in turn, affects the decision as to what to learn next

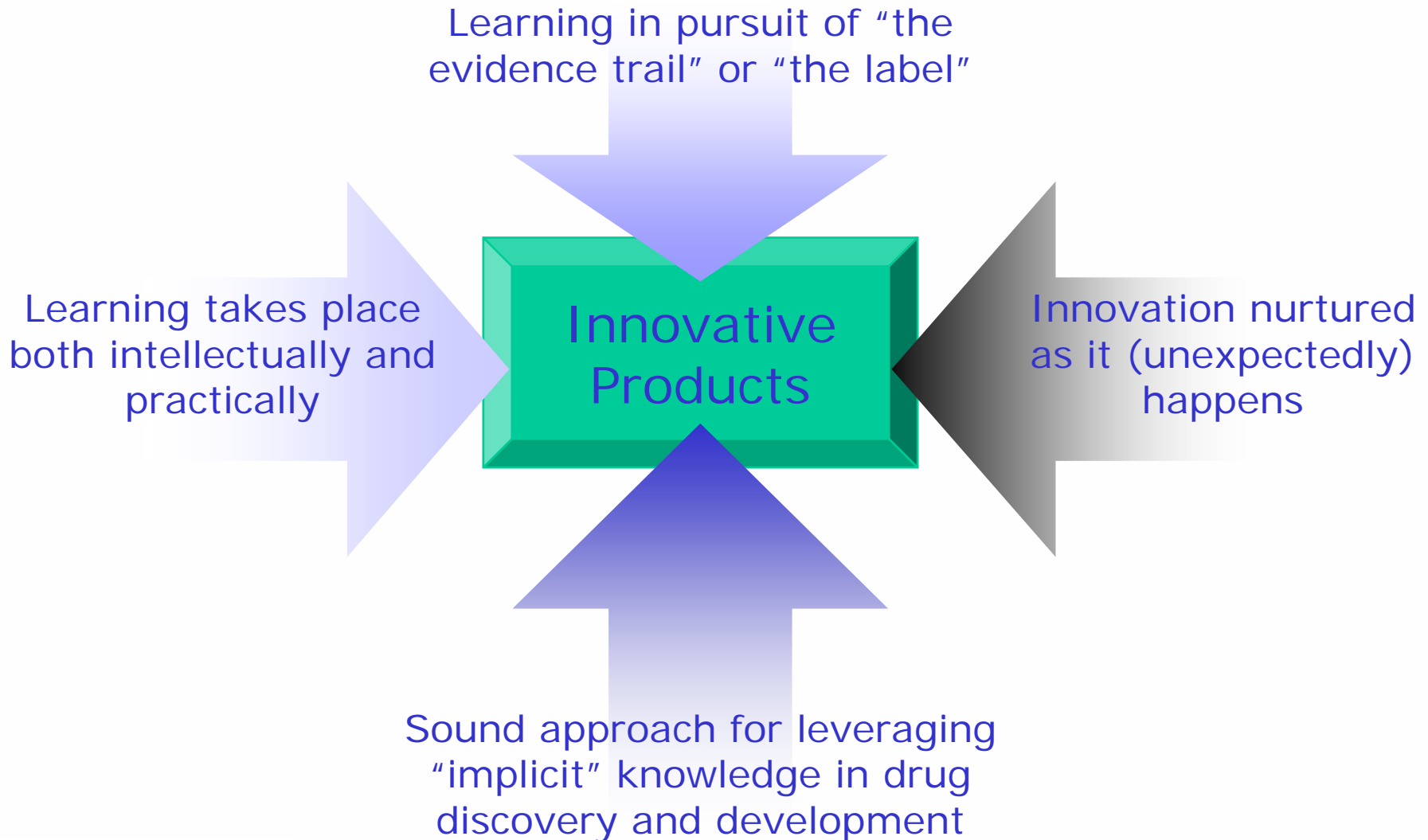


Our goal is to increase useable knowledge

- Clear processes for
 - leveraging implicit and explicit (hard) knowledge
 - accessing external science
 - preparing for innovation
- Clear direction on “productive knowledge boundaries”
- All done within a clear framework of IP protection



Useable Knowledge = finding innovative products



Information Technology is NOT the driver

- There are proven “knowledge processes” -- largely neglected in traditional KM implementations
 - How to extract explicit from implicit knowledge
 - How to share explicit knowledge across teams
 - Continuous versus Just-In-Time learning
 - How to identify and nurture innovative ideas
- Knowledge is the provenance of teams aka Communities of Practice (CoPs) ... and how these are formed and collaborate is a key driver of knowledge usage
- Information Technology emphasis needs to move from trying to package knowledge as an object ... to using technology as a way of sharing experience

Overall Knowledge Structure Program

Start-Up Assignments

Database of Proven Practices
(e.g., Virtual Teams)

VantagePoint Consulting Group

- VantagePoint is a boutique Management Consulting firm serving the Pharmaceutical Industry
- We specialize in business transformation, experienced in R&D, Clinical, Finance, and Information Management
- Our senior staff come from leading consulting firms and companies
 - Staff have 15 to 20 years consulting / business experience
 - Booz-Allen Hamilton, First Consulting Group, PWC, E&Y, J&J, Baxter, Dendrite
- Our consulting services include:
 - Operational excellence/Six Sigma
 - Change management
 - Knowledge Management
 - Team Effectiveness
 - Organizational Excellence
 - Systems Readiness Assessments

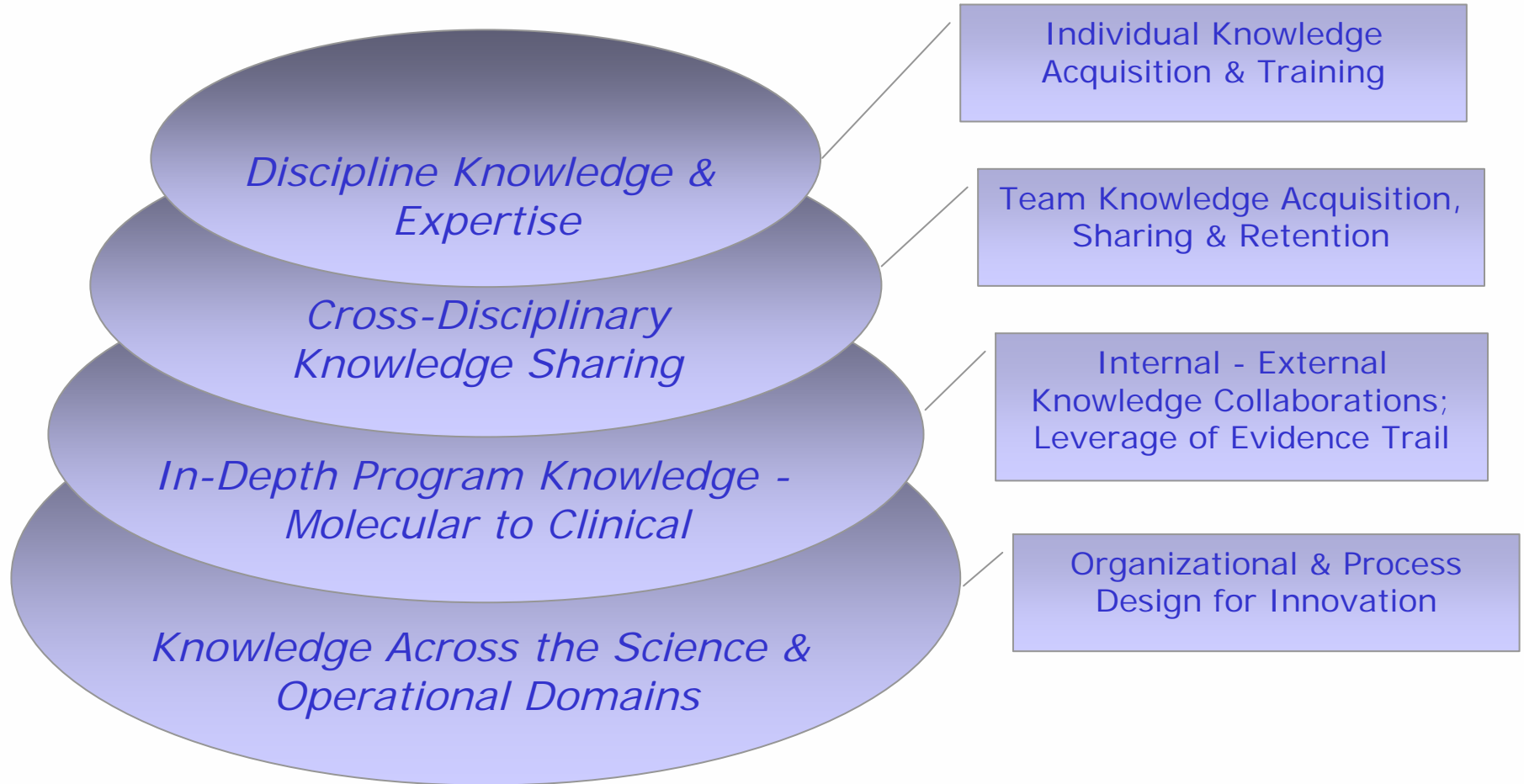
Knowledge Management Experience

- Development of knowledge and information management strategic roadmap for the Global Strategic Marketing Group of a Fortune 100 Pharmaceutical Company
- Facilitation of enterprise knowledge management user requirements and related processes for a leading Biotechnology Company
- Support of the development and implementation of a global knowledge repository supporting key planning, financial, and sourcing functions of a leading global Pharmaceutical Company
- Development of a five year R&D knowledge management strategy and transformation roadmap for a leading Healthcare and Pharmaceutical Company

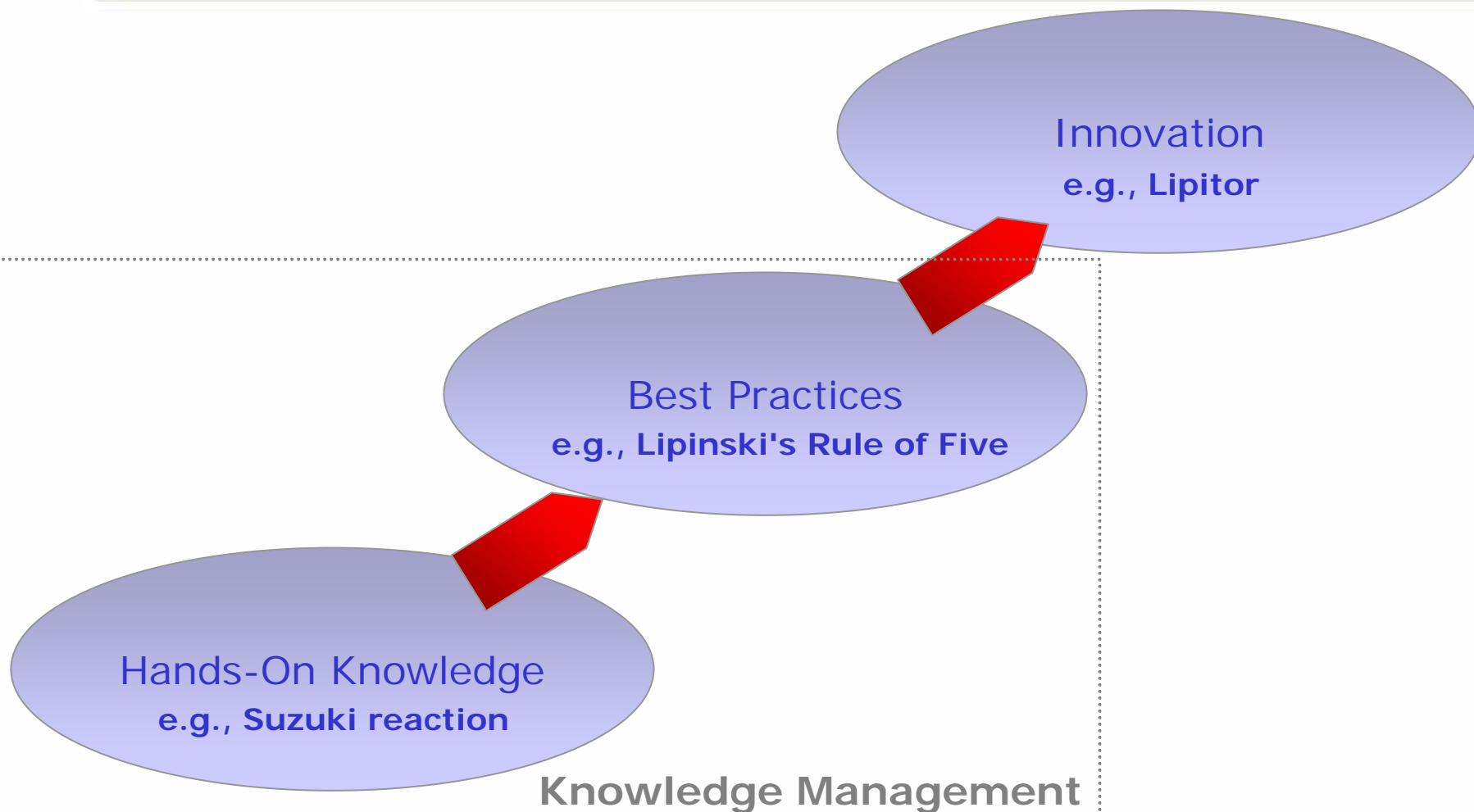


Appendix - Knowledge Structure Design Components

Knowledge Structure Layers



Learning beyond the current boundaries



Traditional Knowledge Management Can Only Take You So Far