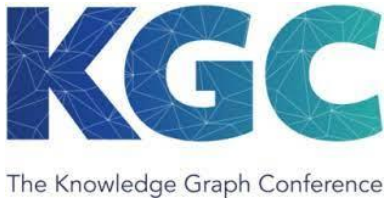
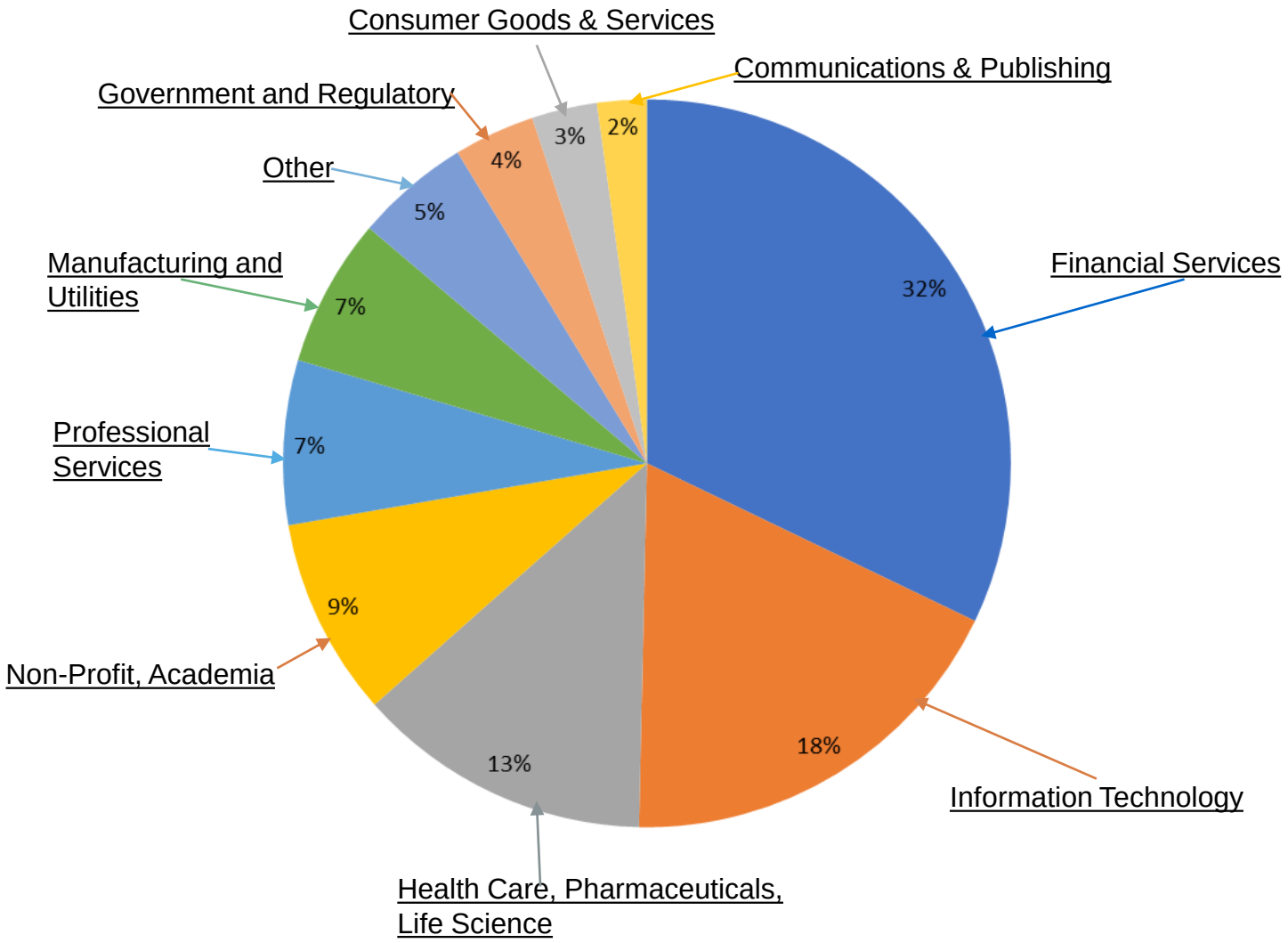
Knowledge Graph Industry Benchmarking Survey

May 2021 ● Knowledge Graph Conference



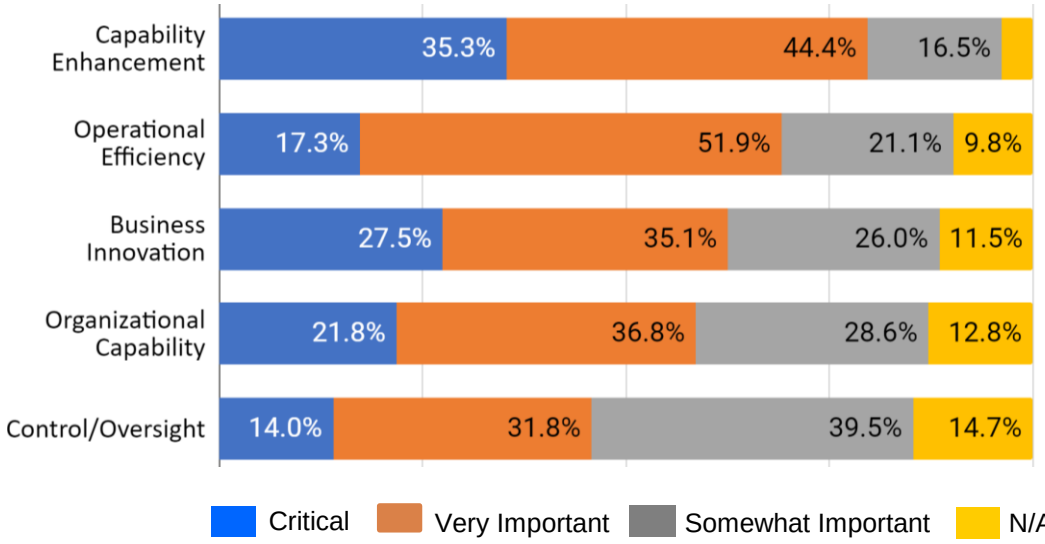
EKG Survey Profile



- Most of the survey responders are engaged practitioners.
- About half have been working with knowledge technologies for less than three years. The other half have been at this game for a long time.
- Most responders are either working in huge companies or small entities.
- Most are still generally in the infrastructure/support function – with the overwhelming majority responding for the entire enterprise.
- Participants are mostly playing "inside baseball" … nestled in the data and IT weeds … working on ontology development, business architecture, data engineering and data modeling

KNOWLEDGE GRAPH DRIVERS

DRIVERS



What are the Primary Reasons for Adopting Knowledge Technologies?

Capability Enhancement [score = 281] **-** analytical flexibility, data science, improved data quality

Operational Efficiency [score = 235] **-** automation, cost containment, digitization, resiliency

Business Innovation [score = 234] **-** client 360, improved customer experience, product and market insight

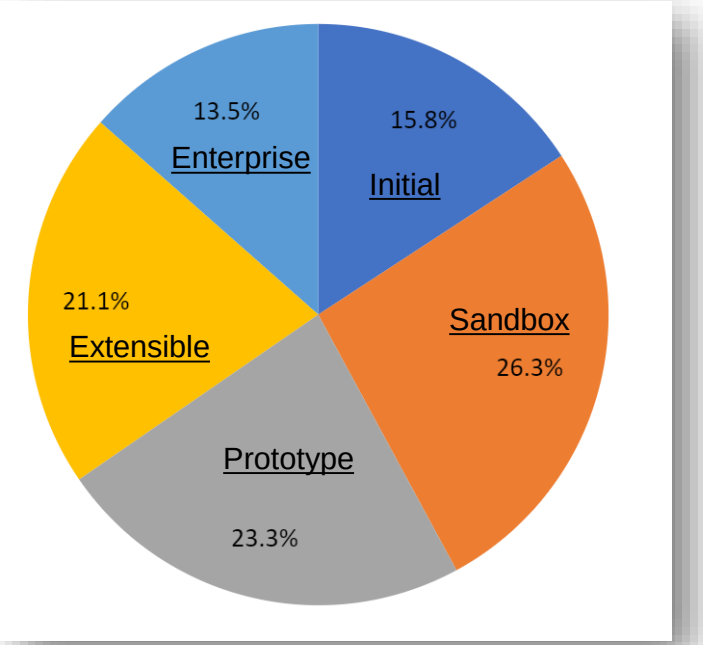
Organizational Capability [score = 223] **-** no better way to address "insolvable" problem

Control/Oversight [score = 187] **-** regulatory compliance and simplification of governance

- Enhanced capability and business innovation are the clear drivers and considered critical to success.
- Most existing use cases are still focused on core data management objectives *(i.e., data harmonization, content integration, entity resolution and lineage).*
- Demonstrating business value is dependent on building foundational prerequisites *(i.e., identity resolution, shared meaning, mapping and conceptual search)* – beware of the gap between promise and delivery.

KNOWLEDGE GRAPH MATURITY

MATURITY



What is your Organization's Current Level of Maturity?

Initial [EKG/MM Level 0] – No current knowledge graph initiatives

Sandbox [EKG/MM Level 1] – Pilots and POCs for limited use cases

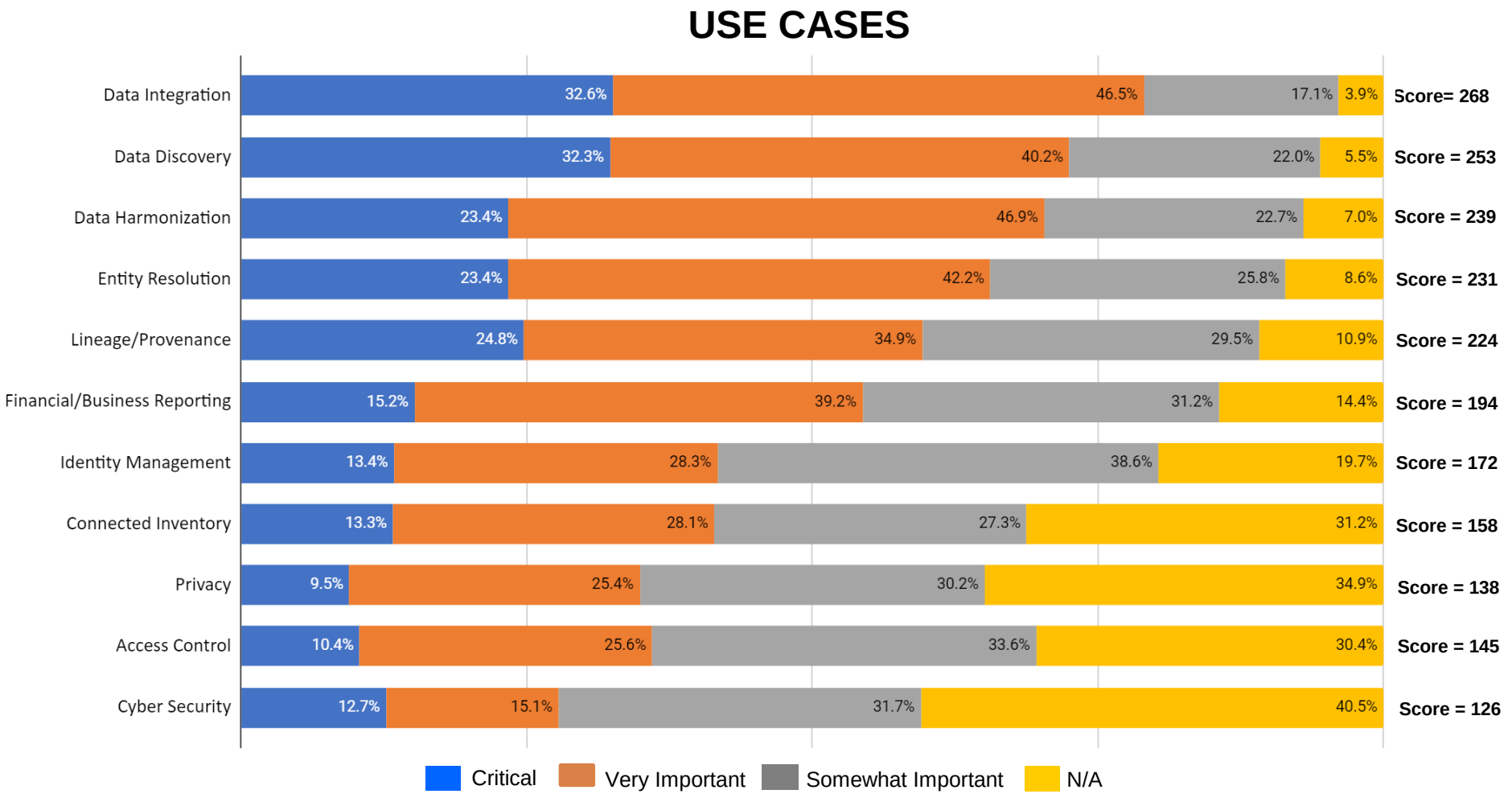
Prototype [EKG/MM Level 1] – Operationalizing pilots and POCs for limited use cases

Extensible [EKG/MM Level 2] – Production ready for multiple (related) use cases; reusable architecture

Enterprise [EKG/MM Level 3] – Multiple groups; scalable architecture; mission-critical applications

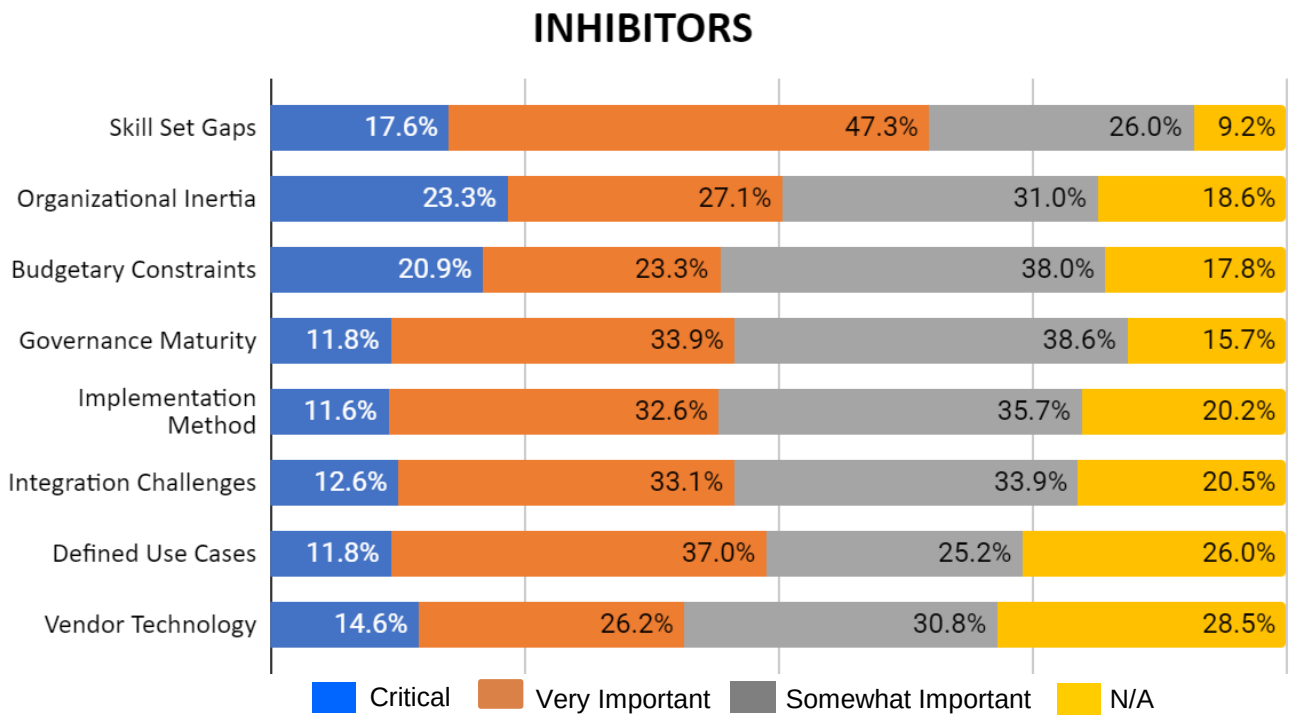
- Knowledge graph is still in the "emerging" (experimental) stage [50% are at level 1 (pilot/POC for isolated use cases; 35% are Level 2+ (extensible/scalable platform, reusable architecture, expanded design principles, parallel KG activities, dedicated resources for design/build].
- The gap between maturity levels is significant. Making the leap from experimental to operational and feeding other use cases is difficult and not to be underestimated.
- 34% of those at the more advanced maturity stage are "end users" mostly from big companies in DoD, publishing, consumer services, health care, manufacturing [52% are IT; 15% are consultants].

KNOWLEDGE GRAPH USE CASES



- Capability enhancement and business innovation are the desires – but operational infrastructure and achieving a "control environment" is still what most define as critical
- The initial goals are related to integrating data into operational environments – this is the pre-requisite for achieving business value
- Control environment *(integration, harmonization, entity resolution, inventory, lineage, identity management)* represent 60% of primary use cases.
- Business focus *(discovery, reporting, privacy, access control, security)* represent 40% of use cases driving adoption

KNOWLEDGE GRAPH INHIBITORS



Skills [score = 227] – lack of skills; trained staff; internal expertise

Organization [score = 200] – overcoming organizational inertia; no champion

Money [score = 190] – no budget; too expensive

Governance [score = 180] – low level of core data management maturity

Method [score = 175] – don't know where to start; no implementation playbook

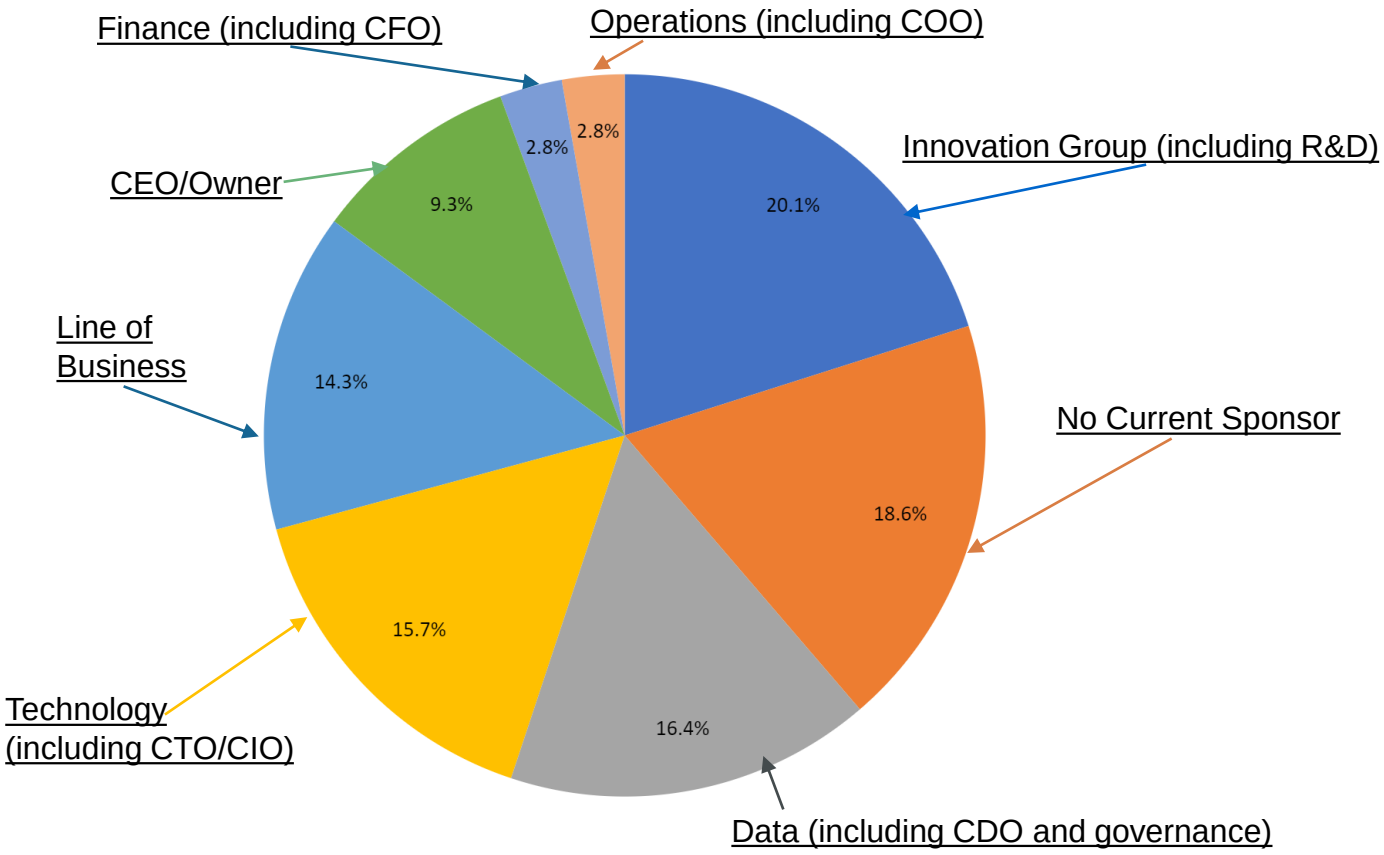
Integration [score = 175] – hard to integrate into existing environments

Use Case [score = 171] – undefined use case; no value proposition

Vendor Technology [score = 165] – not ready for enterprise needs

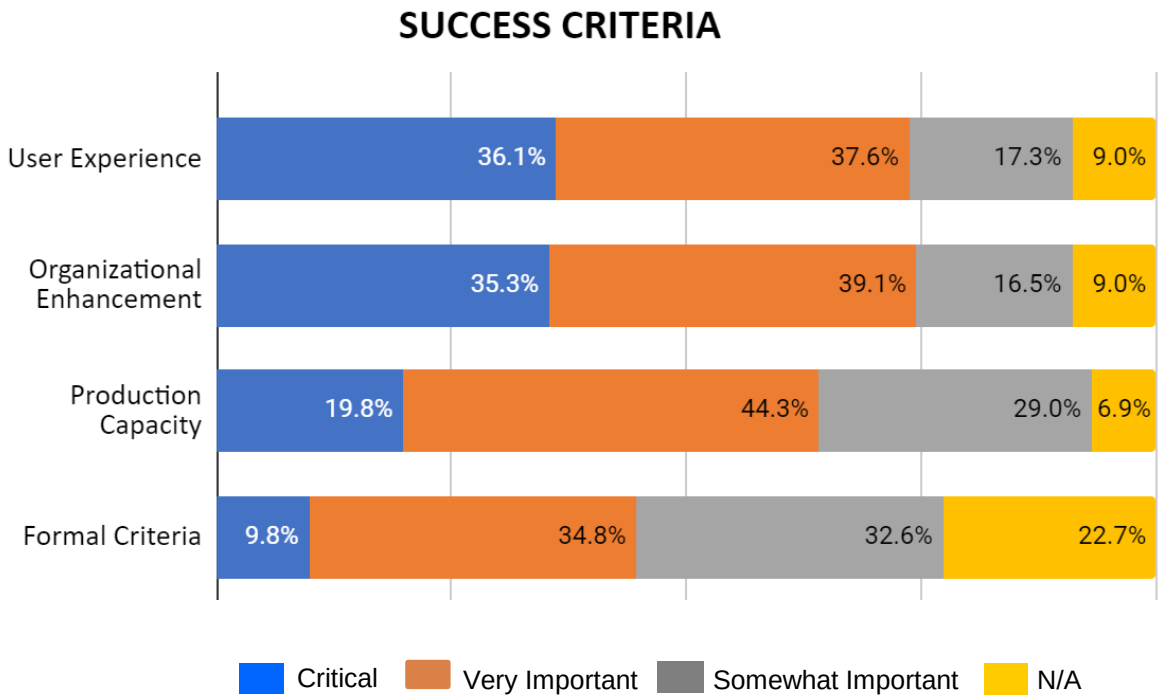
- Organizational concerns *(overcoming inertia, navigating the skills gap, dealing with budgetary constraints, governance maturity)* are dominant inhibitors to knowledge graph adoption.
- Small and dedicated teams of experts are supporting early adoption. The "skills gap" and "execution capability" are looming as concerns as we move from technology innovation to operational deployment.
- The most important challenges currently facing the knowledge graph community are those related to the "business narrative" *(convincing executive leadership to lead … defining implementation requirements in concrete business terms … building empirical metrics … and having pragmatic discussions on what is really required to cross the knowledge graph minefield).*

KG Initiative - Primary Sponsor



- The principal sponsors (71%) are from the innovation group, technology and data management.
- C-suite executives *(CEO, COO, CTO, CFO)* are still critical in providing air cover for knowledge initiatives.
- Knowledge graph initiatives are still viewed by many as “experimental” and have not yet been fully integrated into the business culture of the organization.

KG Initiative - Success Criteria



Score = 267

User Experience – ease of adoption, compelling use case

Score = 267

Organizational Enhancement – competitive advantage, enhanced capabilities

Score = 232

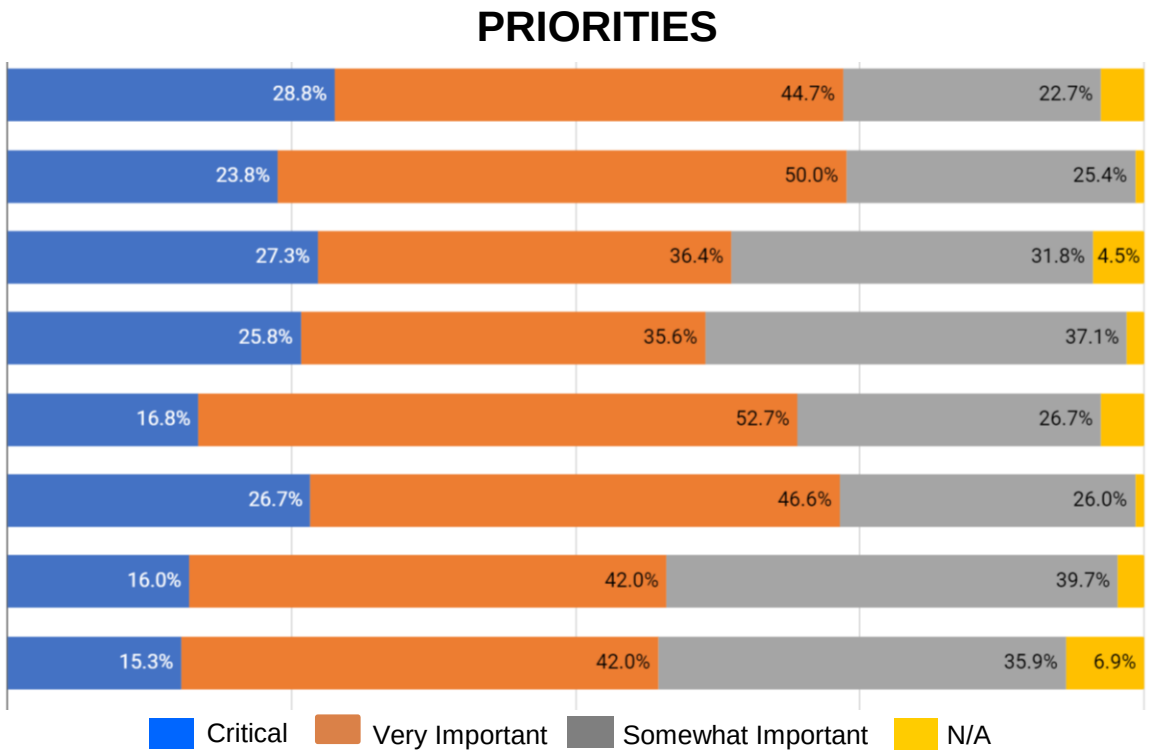
Production Capacity – testing, integration, scalability

Score = 174

Formal Criteria – TCO, ROI, other KPIs

- Measurement criteria for evaluating the success of these projects are still fuzzy *(and likely hard to demonstrate).*
- Formal criteria to demonstrate ROI is desired by business but not prioritized as the way to measure success of the knowledge graph initiative.
- Translating foundational capabilities *(i.e., identity resolution, locking down meaning, conceptual search)* into concrete business terms is a pragmatic challenge to address.

KNOWLEDGE GRAPH PRIORITIES



Standards [score = 262] **–** Consistency and interoperability of standards

Methodology [score = 256] **–** Methodology, best practices and implementation guidance

Business Case [score = 246] **–** Business case, ROI research and benchmarking

Datasets [score = 245] **–** Curated data sets and shared ontologies

Expertise [score = 239] **–** Communities of practice and access to expertise

Use Cases [score = 231] **–** Use cases and case studies

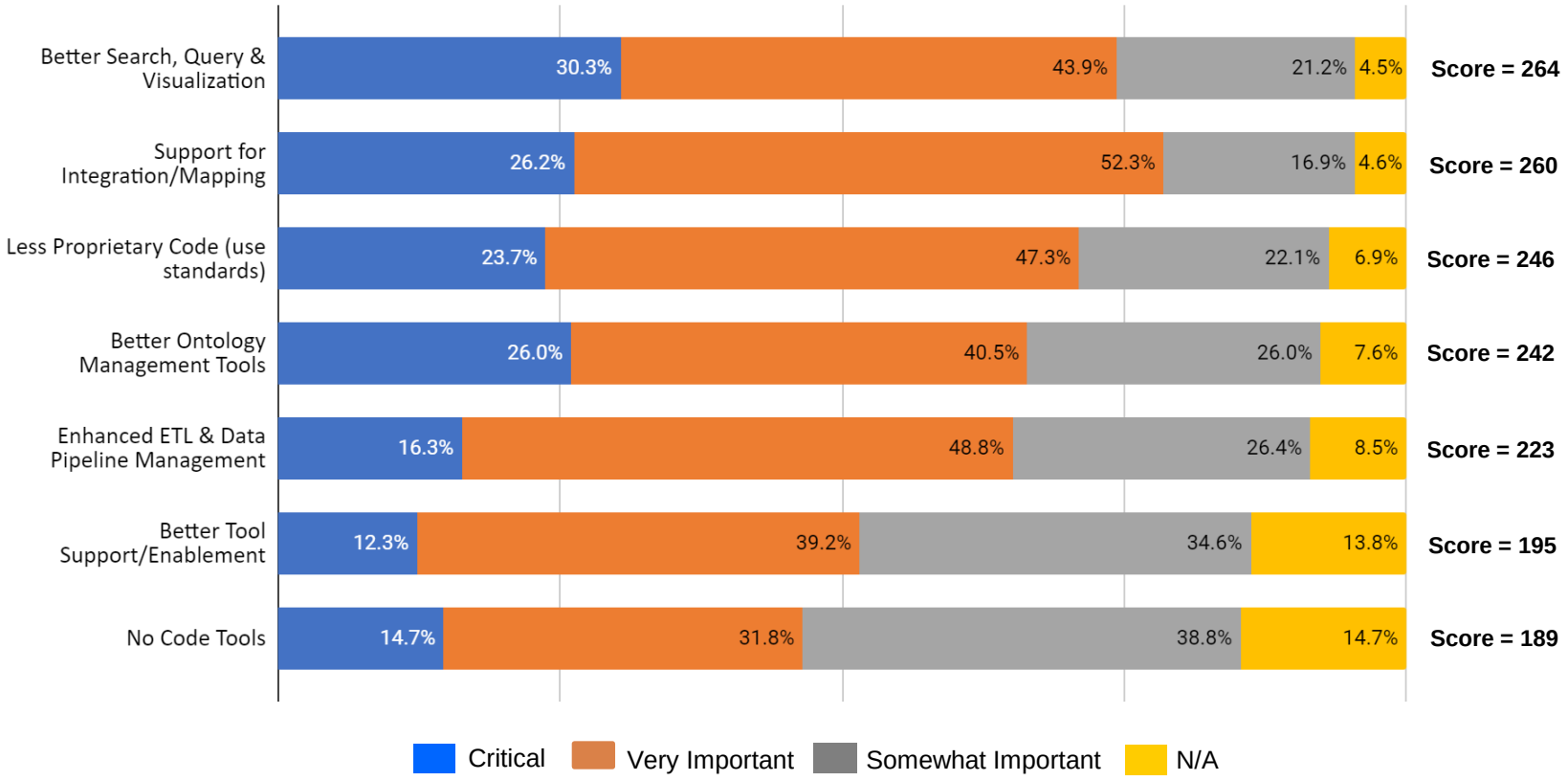
Directory [score = 225] **–** Directory of tools (open source and vendor specific

Education [score = 217] **–** Education, training and certification programs

- Priorities are evenly distributed with interoperability of standards across platforms at the top of the list.
- Implementation-related priorities *(interoperability, method, best practices, shared ontologies, directory of tools)* reflect the practitioners who responded.
- If you combine the ROI/business case with use case/case studies (which are similar) – it jumps to the top of the list of priorities.
- A cautionary note of the potential mismatch between the implementation priorities of the practitioners and the capability enhancement drivers of business.

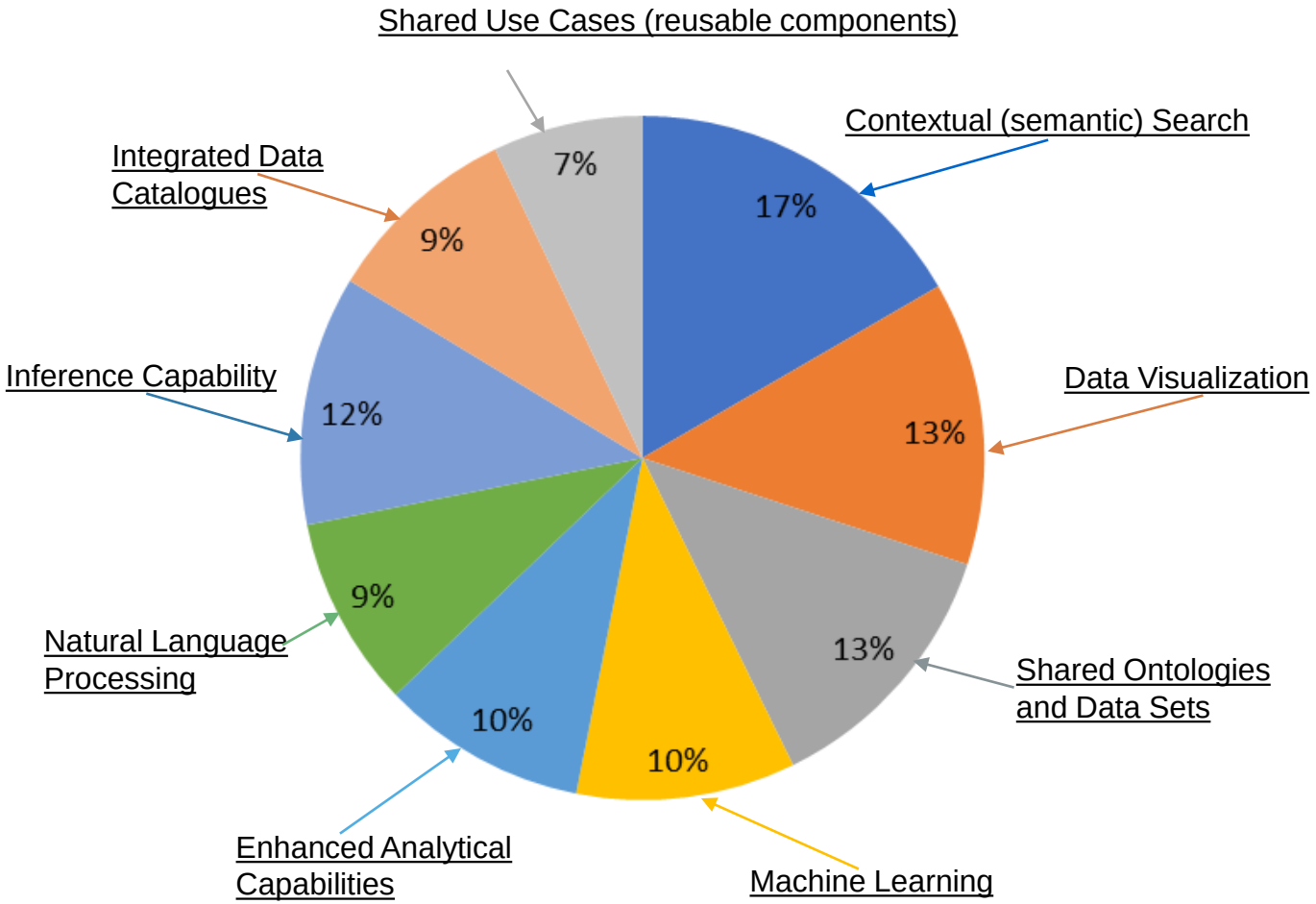
KNOWLEDGE GRAPH VENDORS

VENDOR ENHANCEMENT



- The perception is that knowledge graph vendor capability has significantly matured. Good progress!
- Combine this with the "inhibitors" chart – *"vendor technology not being ready for enterprise needs"* is at the bottom of the list.
- At the top of the wish list for vendors is contextual search and visualization capability *(supporting end users in getting data out of the graph)* as well as support for integration and mapping.
- More good news about the value of machine learning as the pathway to salvation for the mapping challenge.
- Bottom line for vendors is about supporting global interoperability across platforms … adoption of industry-level standards … and supporting the goal of "common language" across all participants.

Future of Knowledge Technology



- Three of the top four future priorities are about semantic search, data visualization and machine learning *(reinforcing the wish list from vendors).*
- Rounding out the top four is the topic of shared *(industry-level)* ontologies and curated data sets.
- Reinforces the message about global interoperability across platforms and support for a common language across all platforms, publishers, supply partners and consumers *(the industry wants interoperability standards).*
- Almost nothing on our list of future topics was rejected. The industry wants it all. And at the end of the day, it is a good report card – with a positive message.

Four Key Takeaways

1. **Early Stage**: Knowledge technologies are still emerging as the pathway out of the (very real) challenges of incongruence, silo operations and structural rigidity.

2. **Investment is Required**: There is a foundational capability that is required before the delivery of business value (*i.e., discovery, traceability and integration*). Don't ignore the importance of "data as infrastructure" – it is the driver!

3. **Not Technology**: Overcoming organizational inertia is a serious obstacle. Perhaps we should stop talking about how it works. It is not as important as making it work.

4. **Interoperability**: The knowledge industry (providers) have an opportunity to expedite adoption by focusing on global interoperability across platforms. Keep up the good work.

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