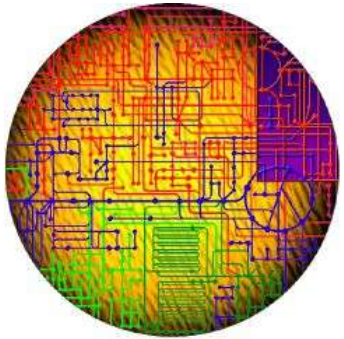
dotlink360

Understanding Interfirm Relationships in Business Ecosystems with Interactive Visualization

Rahul C. Basole | Trustin Clear | Mengdie Hu | Harshit Mehrotra | John Stasko

MICROSCOPE

TELESCOPE



MACROSCOPE

Research Objective

Macroscopic Insight into Business Ecosystems with Interactive Visualization

Focus Domain: Mobile Ecosystem

Smartphone Explosion

Source: Basole and Park (2013)

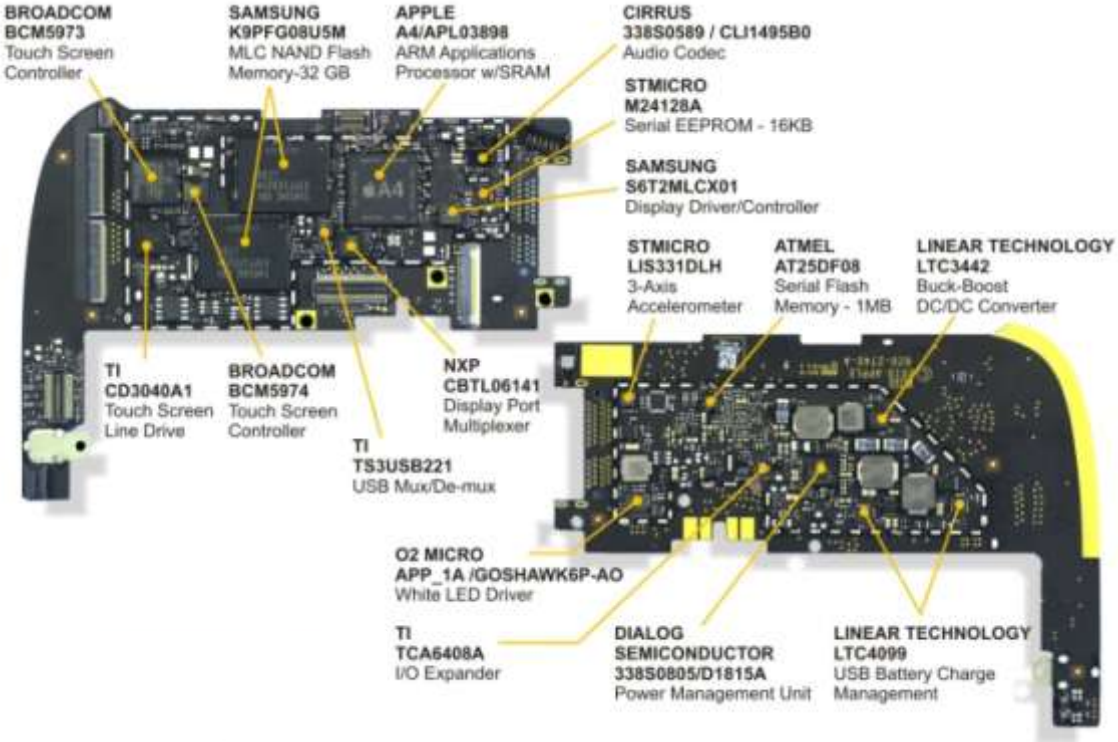
Battle of Platforms

Source: Basole and Karla (2011)

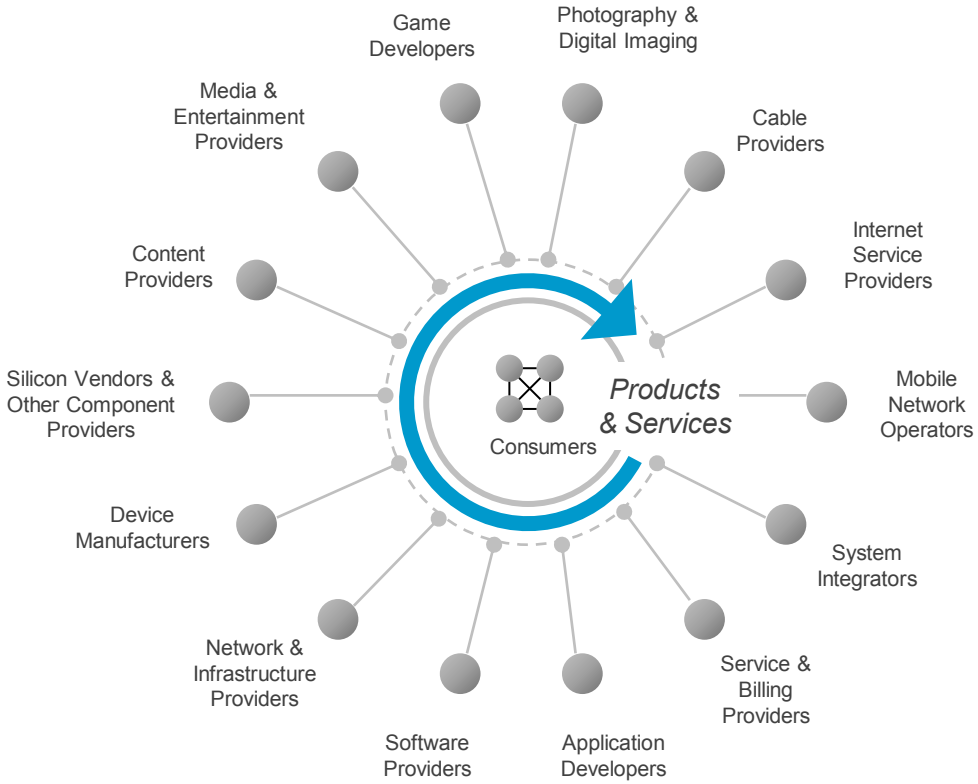
Emergence of Apps & App Stores

2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

Source: Basole and Karla (2012)



Source: UBM TechInsights (2010)



Source: Basole (2009)

Data

SDC Platinum

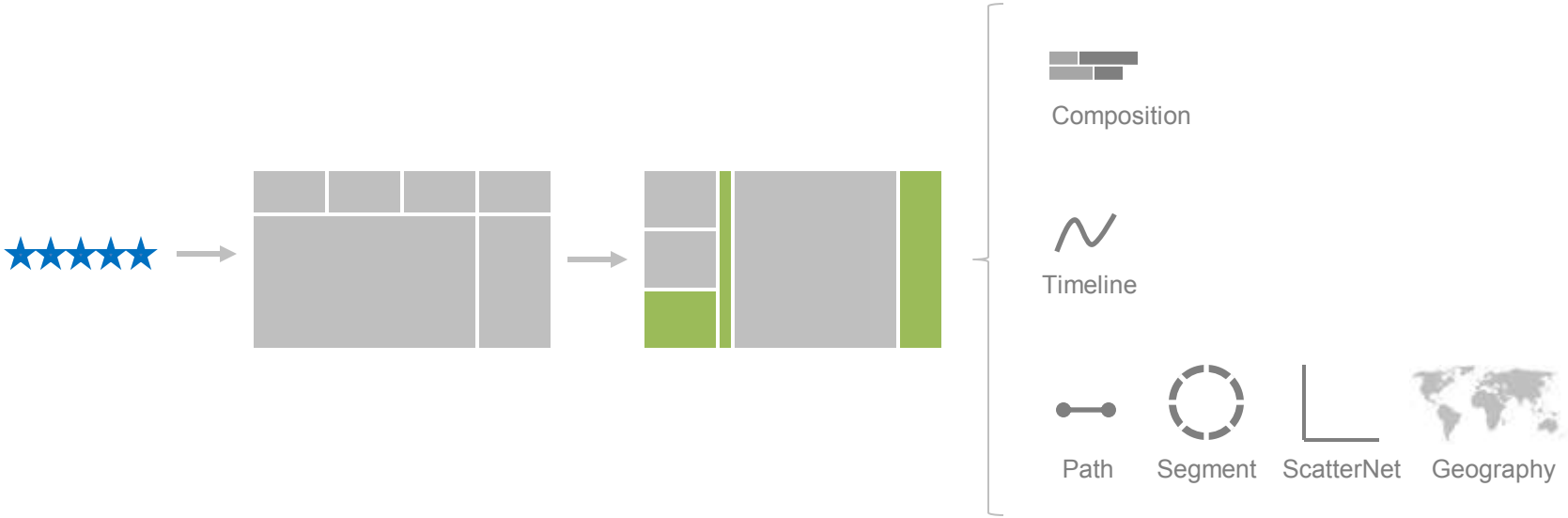
who. what. when. where. why.

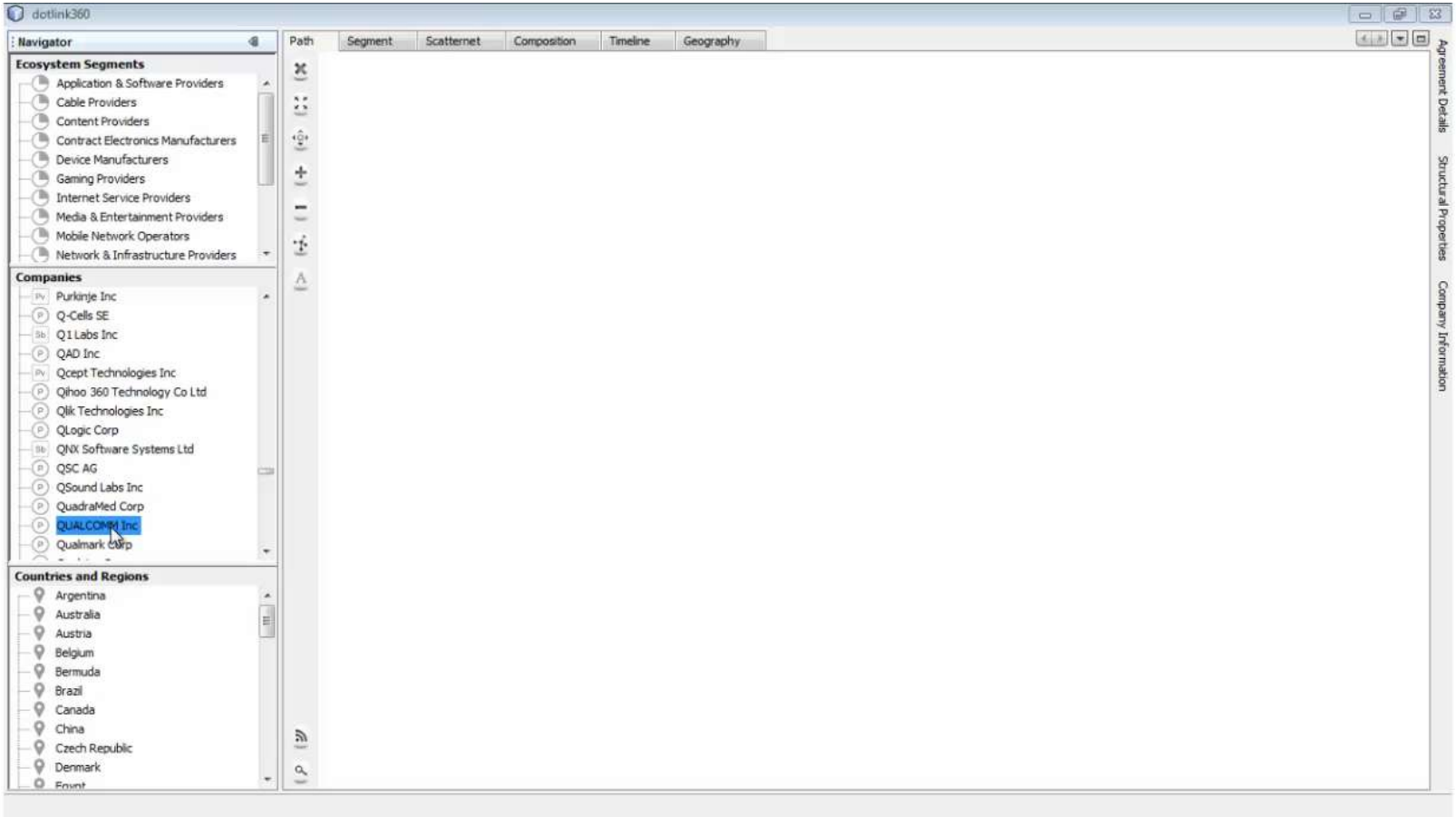
Design Requirements

- Expert Interview
- Field Study
- Literature Revie

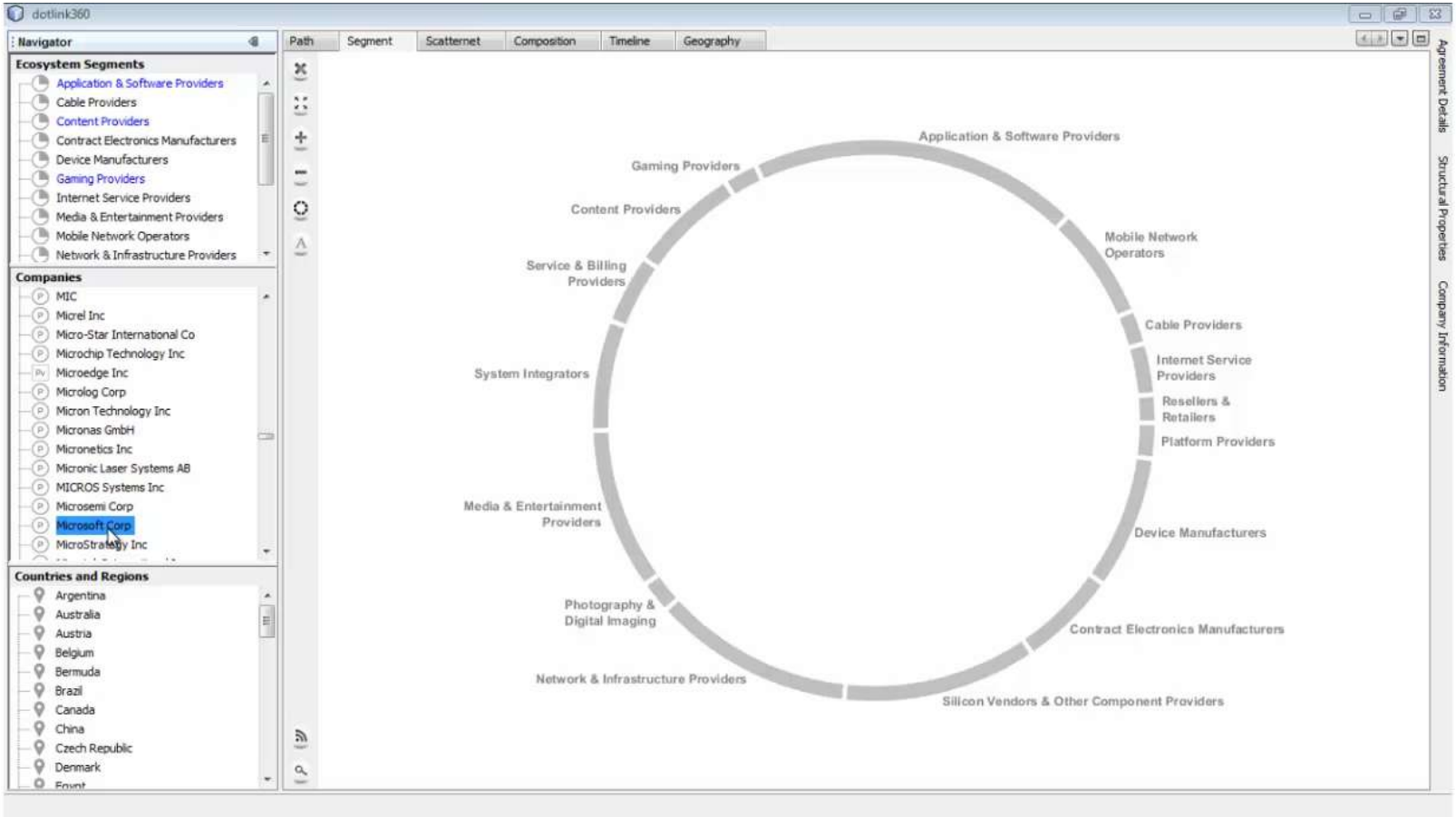
- ★ Both top-down and bottom-up examination of an ecosystem are critical.
- ★ Understanding interfirm connectivity, composition, and temporality is vital.
- ★ Comparative perspectives drive insights.
- ★ Communicate agreement summaries first, then details as desired.
- ★ Provide a familiar metaphor while supporting direct and prompt interaction, not complex queries and commands.

System Design




dotlink360
Navigator
Ecosystem Segments
Application & Software Providers
Cable Providers
Content Providers
Contract Electronics Manufacturers
Device Manufacturers
Gaming Providers
Internet Service Providers
Media & Entertainment Providers
Mobile Network Operators
Network & Infrastructure Providers
Companies
Purkinje Inc
Q-Cells SE
Q1 Labs Inc
QAD Inc
Qcept Technologies Inc
Qihoo 360 Technology Co Ltd
Qlik Technologies Inc
QLogic Corp
QNX Software Systems Ltd
QSC AG
QSound Labs Inc
QuadraMed Corp
QUALCOMM Inc
Qualmark Corp
Countries and Regions
Argentina
Australia
Austria
Belgium
Bermuda
Brazil
Canada
China
Czech Republic
Denmark
Path
Segment
Scatternet
Composition
Timeline
Geography
Agreement Details
Structural Properties
Company Information

Path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Ecosystem Segments
Application & Software Providers
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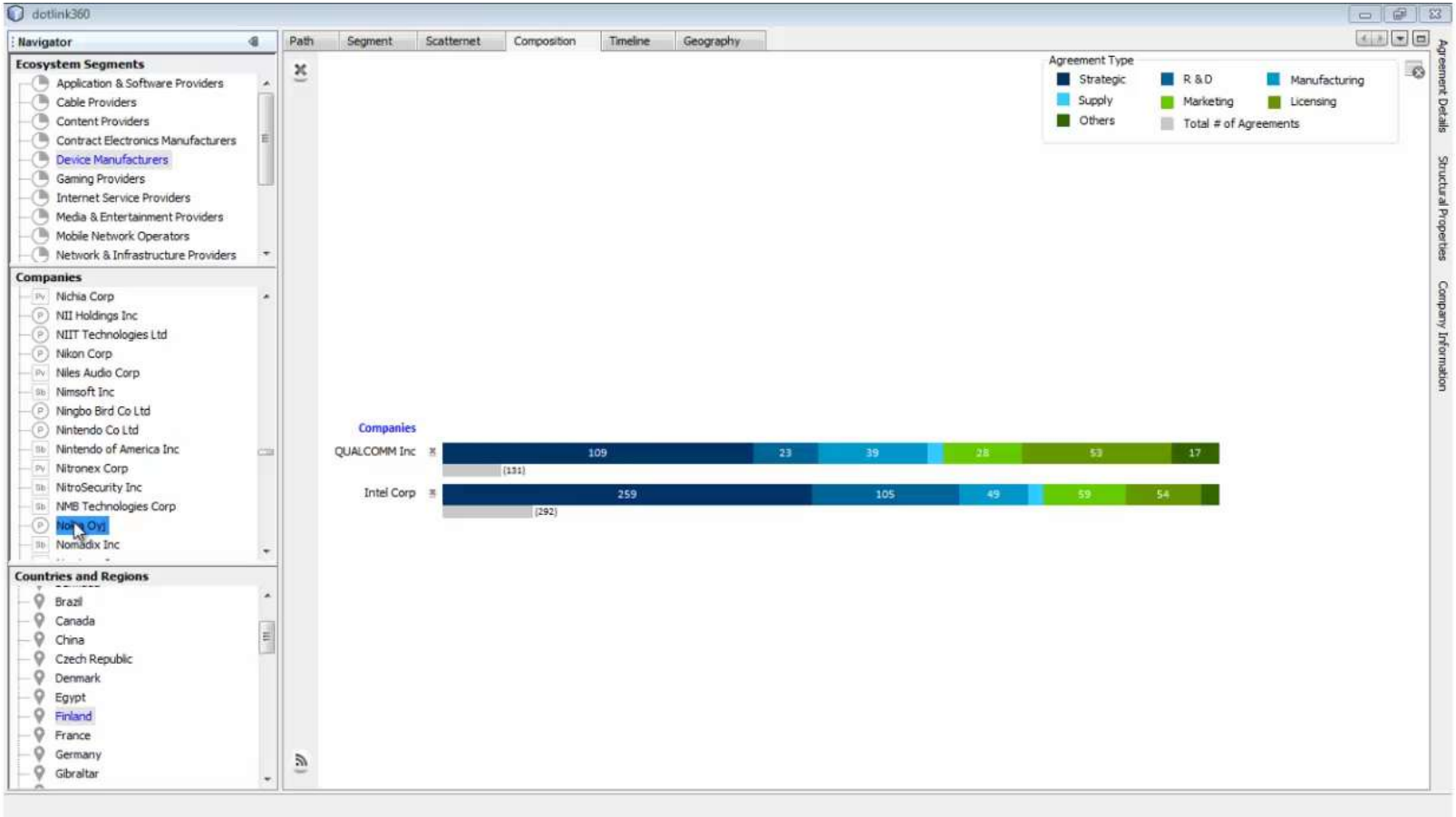
Media & Entertainment Providers
Mobile Network Operators
Network & Infrastructure Providers
Companies
MIC
Micrel Inc
Micro-Star International Co
Microchip Technology Inc
Microedge Inc
Microlog Corp
Micron Technology Inc
Micronas GmbH
Micronetics Inc
Micronic Laser Systems AB
MICROS Systems Inc
Microsemi Corp
Microsoft Corp
MicroStrategy Inc
Countries and Regions
Argentina
Australia
Austria
Belgium
Bermuda
Brazil
Canada
China
Czech Republic
Denmark
Egypt
Path
Segment
Scatternet
Composition
Timeline
Geography
Application & Software Providers
Gaming Providers
Content Providers
Service & Billing Providers
System Integrators
Media & Entertainment Providers
Photography & Digital Imaging
Network & Infrastructure Providers
Silicon Vendors & Other Component Providers
Contract Electronics Manufacturers
Device Manufacturers
Platform Providers
Resellers & Retailers
Internet Service Providers
Cable Providers
Mobile Network Operators
Agreement Details
Structural Properties
Company Information

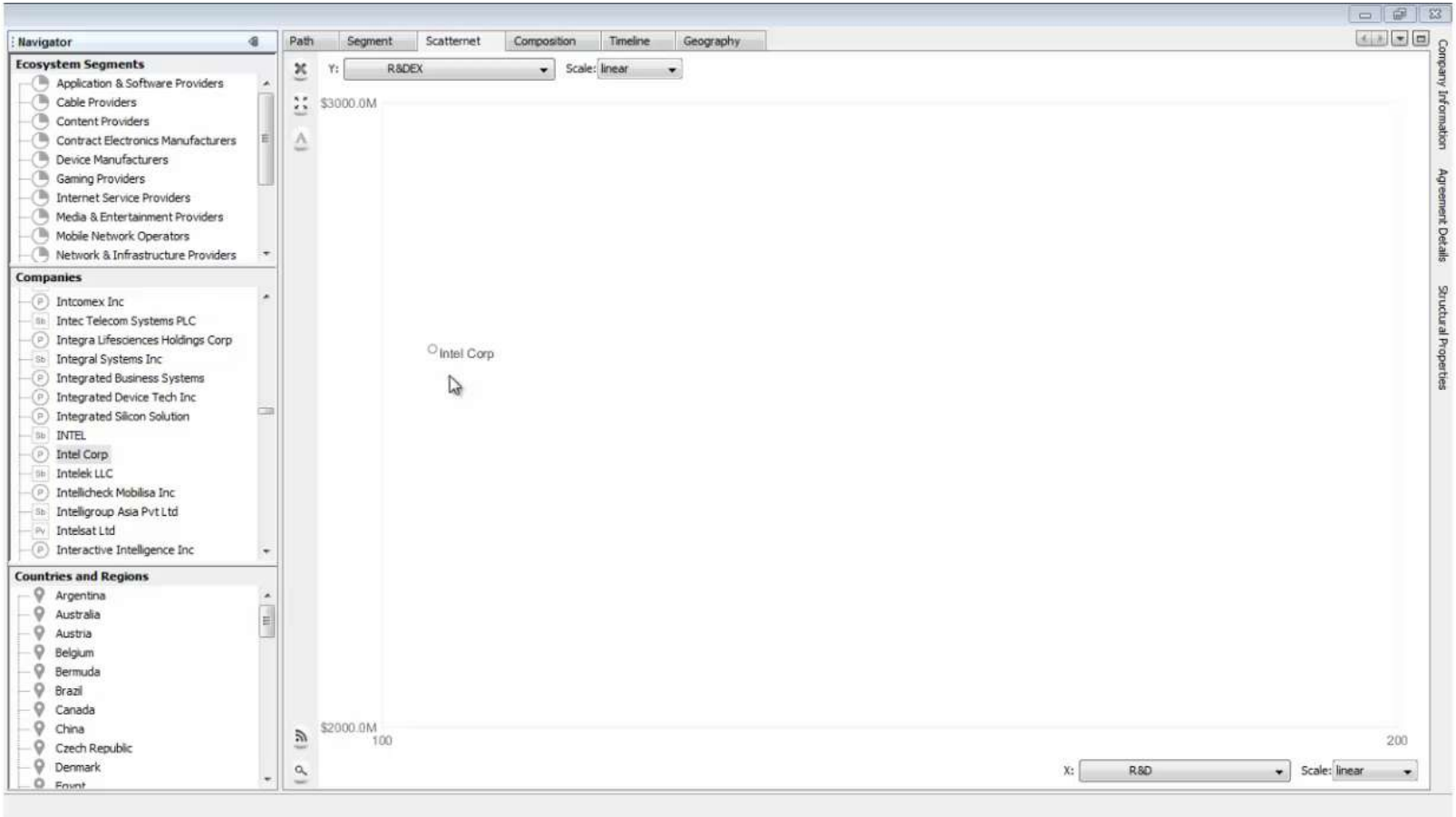
Segment



Composition


dotlink360
Navigator
Ecosystem Segments
Application & Software Providers
Cable Providers
Content Providers
Contract Electronics Manufacturers
Device Manufacturers
Gaming Providers
Internet Service Providers
Media & Entertainment Providers
Mobile Network Operators
Network & Infrastructure Providers
Companies
Saba Software Inc
SAES Getters SpA
SafeNet Inc
Saft
Sage Group PLC
Sage Instruments Inc
Sage Software Inc
SAI
SAIC Inc
salesforce.com Inc
Salmon Ltd
Sammy Corp
Samsung Electronics Co Ltd
Samsung Group
Countries and Regions
Canada
China
Czech Republic
Denmark
Egypt
Finland
France
Germany
Gibraltar
Greece
Hungary
Path
Segment
Scatternet
Composition
Timeline
Geography
Samsung Electronics Co Ltd
Agreement Type
Strategic
R & D
Manufacturing
Supply
Marketing
Licensing
Others
Total # of Agreements
Avg. # of Agreements (Primary Segment)
Avg. # of Agreements (All Segments)
20
15
10
5
0
100%
50%
0%
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
Agreement Details
Structural Properties
Company Information

Timeline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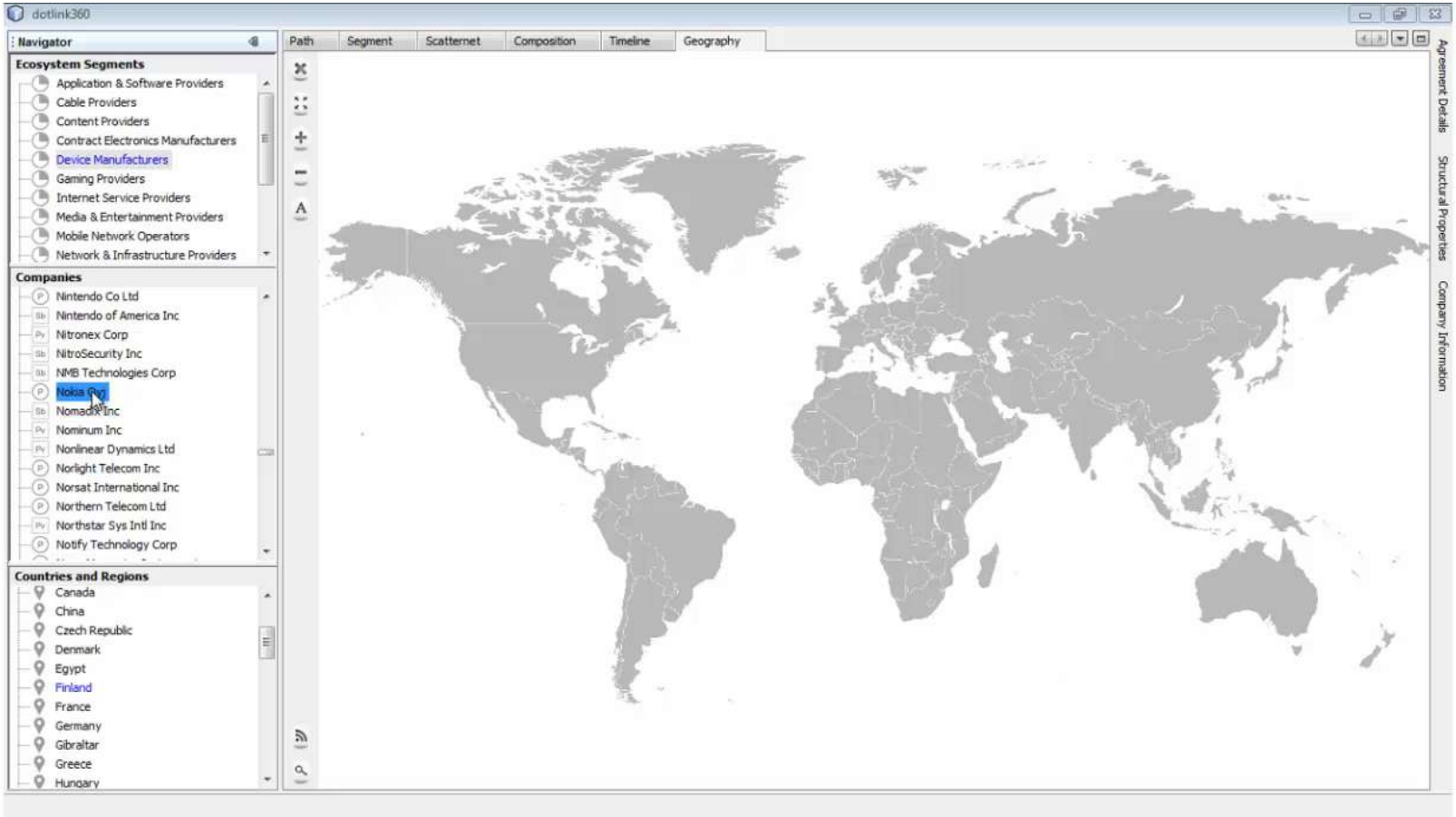
Internet Service Providers
Media & Entertainment Providers
Mobile Network Operators
Network & Infrastructure Providers
Companies
Intcomex Inc
Intec Telecom Systems PLC
Integra Lifesciences Holdings Corp
Integral Systems Inc
Integrated Business Systems
Integrated Device Tech Inc
Integrated Silicon Solution
INTEL
Intel Corp
Intelek LLC
Intellicheck Mobilisa Inc
Intelligroup Asia Pvt Ltd
Intelsat Ltd
Interactive Intelligence Inc
Countries and Regions
Argentina
Australia
Austria
Belgium
Bermuda
Brazil
Canada
China
Czech Republic
Denmark
Egypt
Path
Segment
Scatternet
Composition
Timeline
Geography
Y:
R&DEX
Scale:
linear
$3000.0M
Intel Corp
$2000.0M
100
200
X:
R&D
Scale:
linear
Company Information
Agreement Details
Structural Properties

ScatterNet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Companies
Nintendo Co Ltd
Nintendo of America Inc
Nitronex Corp
NitroSecurity Inc
NMB Technologies Corp
Nokia Oyj
Nomadix Inc
Nominum Inc
Nonlinear Dynamics Ltd
Norlight Telecom Inc
Norsat International Inc
Northern Telecom Ltd
Northstar Sys Intl Inc
Notify Technology Corp
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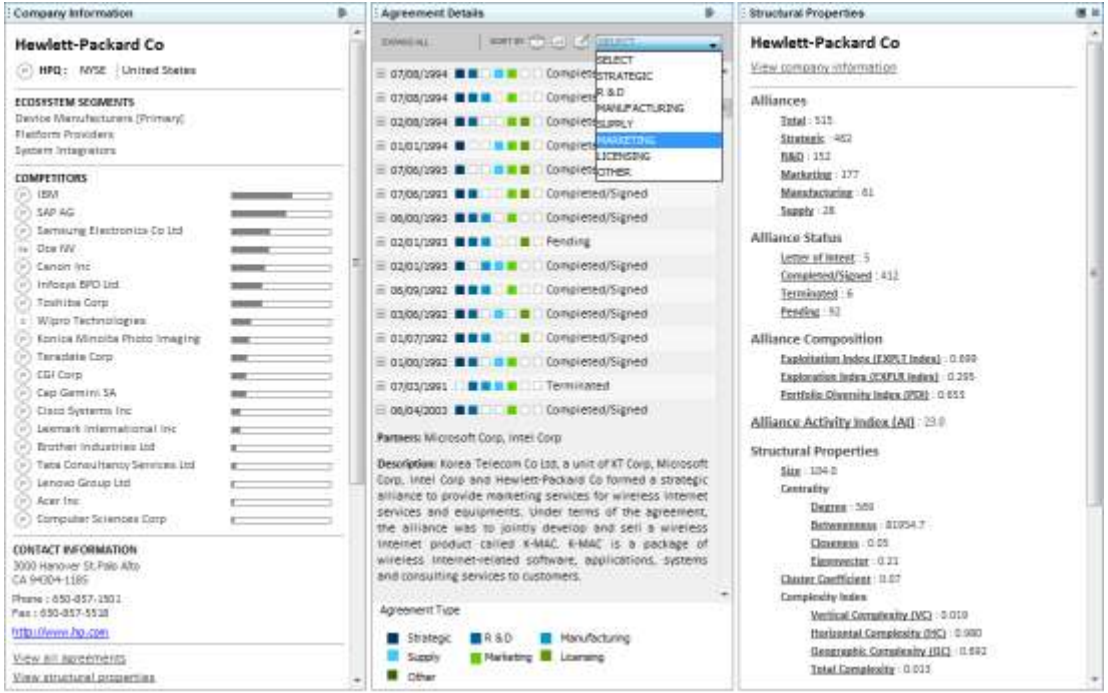


Three Detail Panels can be shown in the right UI region, including information on company,
relationships, and structural characteristics.

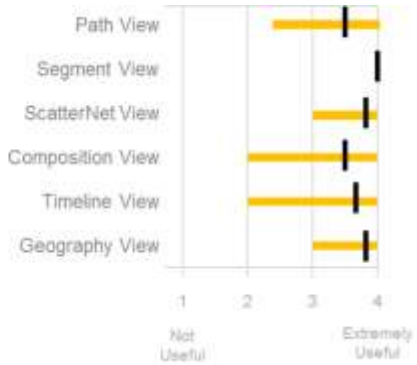
User Study

6 **users**
Prototypical Users
20+ years experience
Mobile ecosystem experience

3 **phases**
Tutorial/Practice/Evaluation

7 **tasks**
Search/Browse/Path/Compound

2 **performance**
Accuracy/Time



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LESSONS LEARNED

- Users were receptive to the ability to quickly browse through long lists of segments, companies, and countries using a familiar explorer-like navigator panel
- Users commented that given the range of functionalities, additional time was necessary for mastery
- Users commented that the tool accelerates their time to insight and helps to improve decision quality.

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Accuracy/Time

DESIRED FEATURES

- Ability to save and output information and visualizations
- “Undo” function to return visualizations to a previous state.
- More flexible ways to select sub-networks and individual nodes via an operation such as rubber-banding.
- Present a subset of the visualization in a traditional list form,

Conclusions

Described the development process, design, instantiation, and evaluation of a system, dotlink360, for helping corporate analysts gain insight into business ecosystems.

System enables analysts, investors, and executives to make sense of the complex interfirm landscape and conduct competitive intelligence analysis.

Presented a requirements-driven analysis of the domain, with insight gained from an initial field study and from the design process and evaluation of the system.

Contributes to the relatively unexplored, but promising area of exploratory information visualization in market research and business strategy

Future Work

Other data sources.

Dynamically-driven and custom data.

Enhance filter.

Longitudinal user study.

Web-based platform.

Acknowledgements

This work was supported in part by the National Science Foundation under awards IIS-0915788 and CCF-0808863 and funding by the Tennenbaum Institute, the Institute for People & Technology, and the GVU Center at Georgia Tech.

 | Contact Rahul C. Basole, PhD. basole@gatech.edu for more information about dotlink360.

Thank you! Questions?

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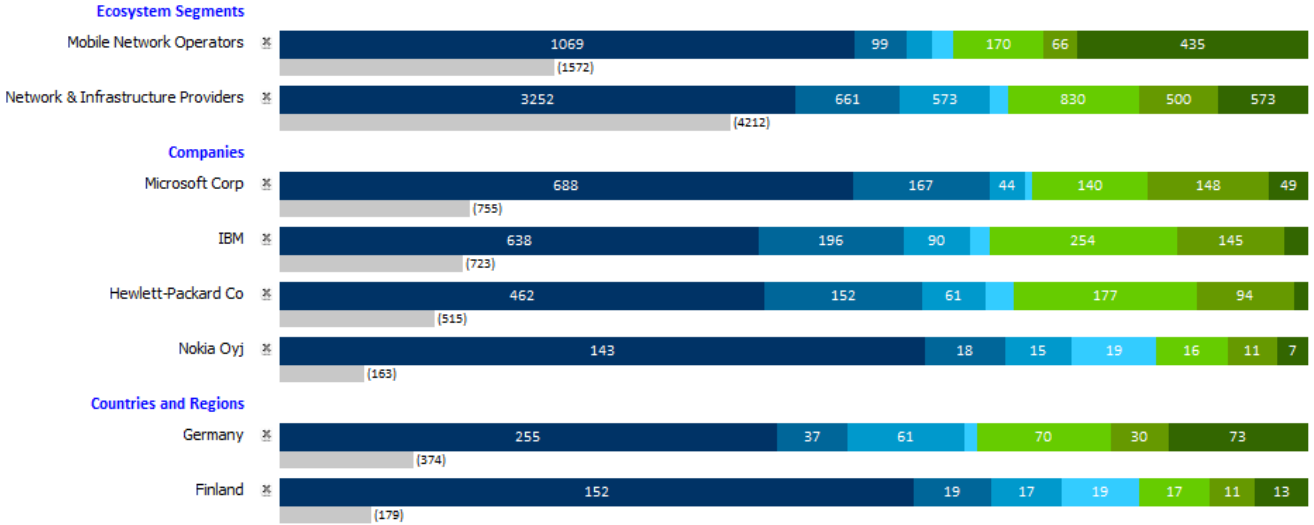
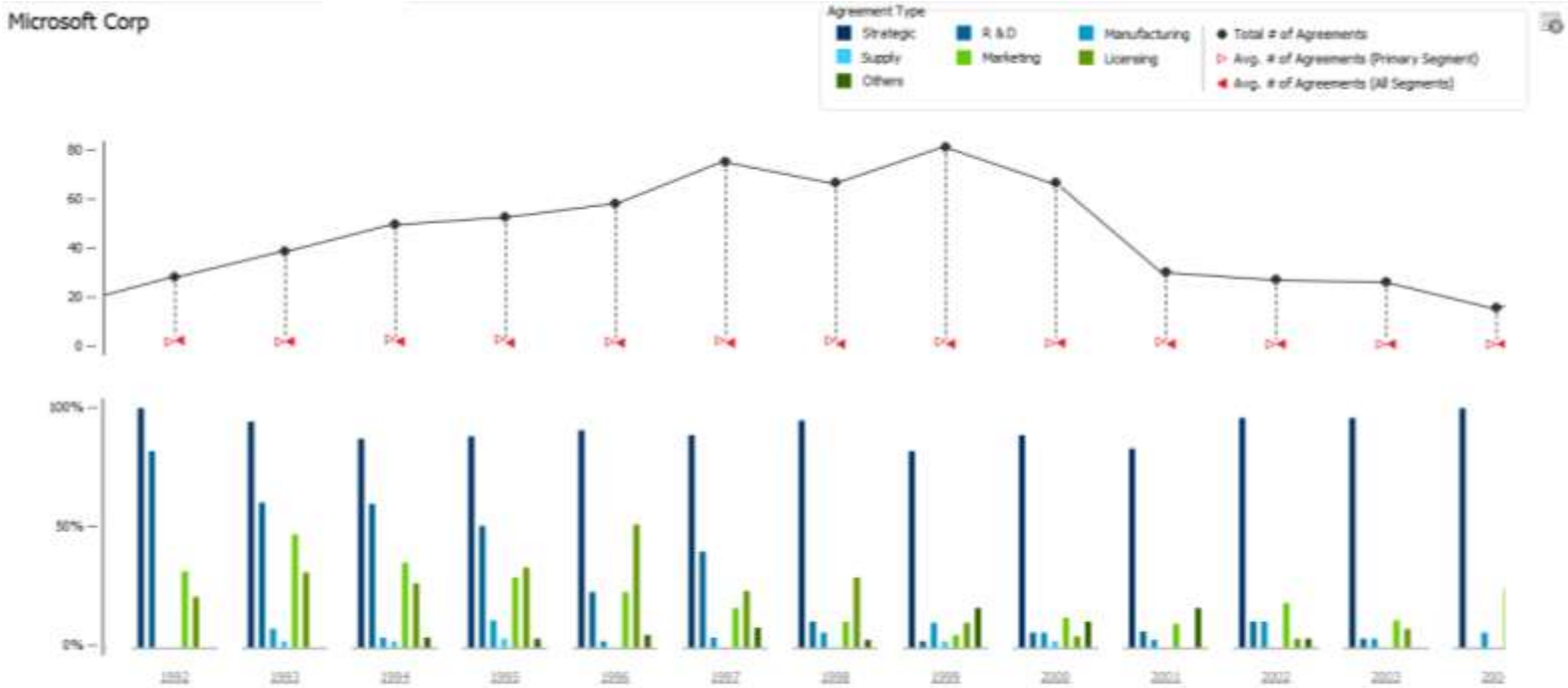
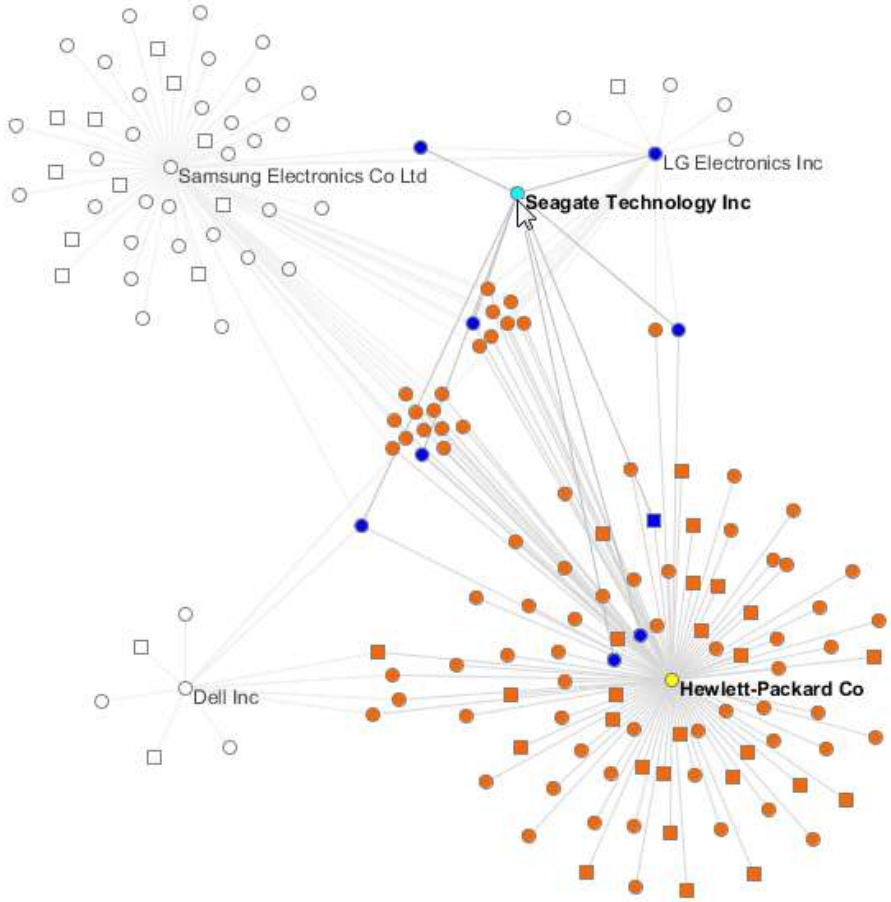


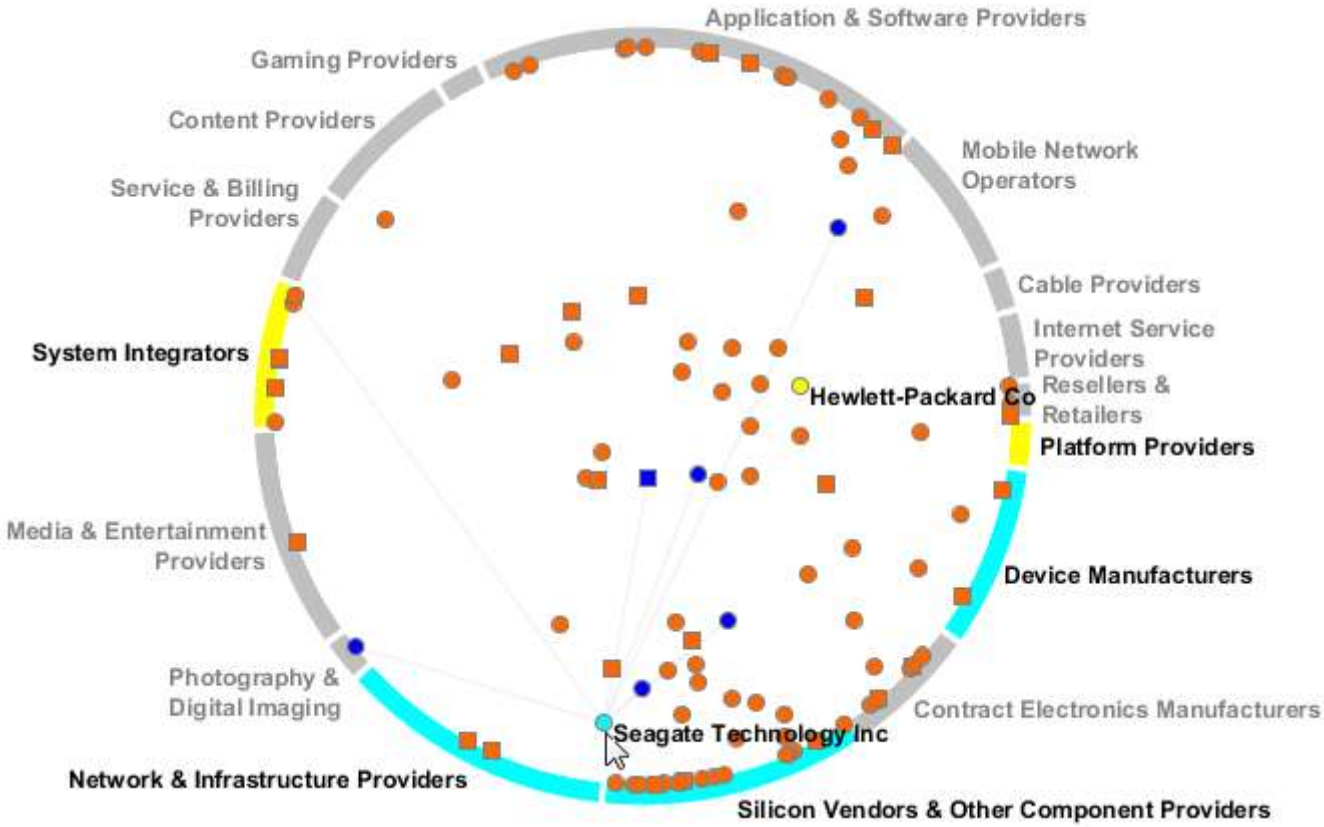
The Composition View shows the agreement portfolios of companies, market segments, and countries.
The top bar for each encodes proportion of agreement types, while the bottom depicts total count.



The Timeline View shows total agreement count relative to primary segment and overall ecosystem (top)
and a yearly/monthly breakdown by agreement type (bottom).


Intel Corp
Nokia Oyj
QUALCOMM Inc
Texas Instruments Inc
Apple Inc


Samsung Electronics Co Ltd
LG Electronics Inc
Seagate Technology Inc
Dell Inc
Hewlett-Packard Co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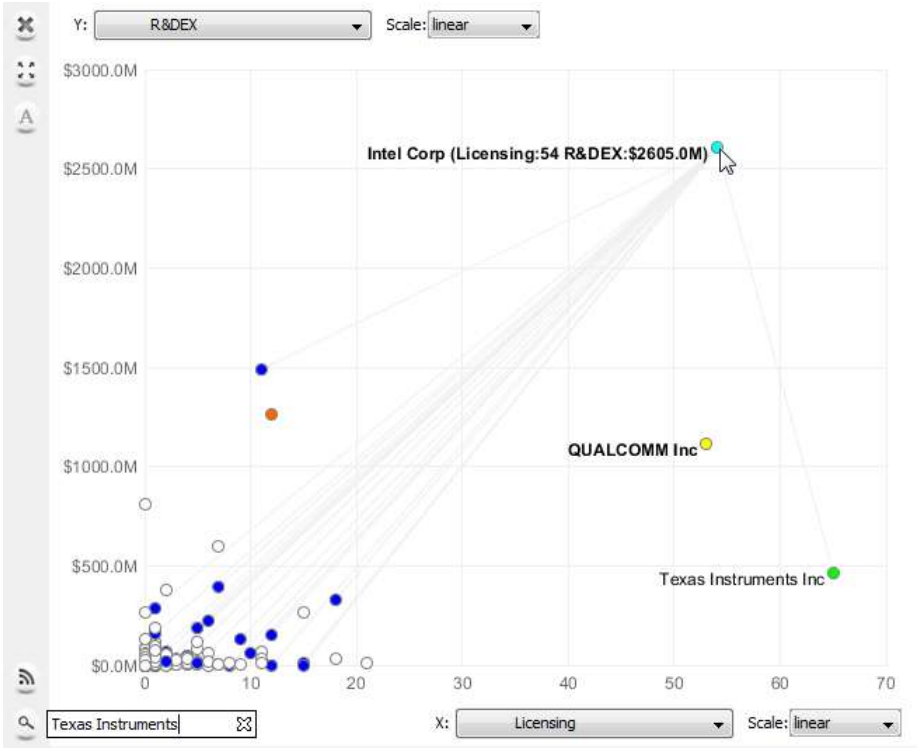
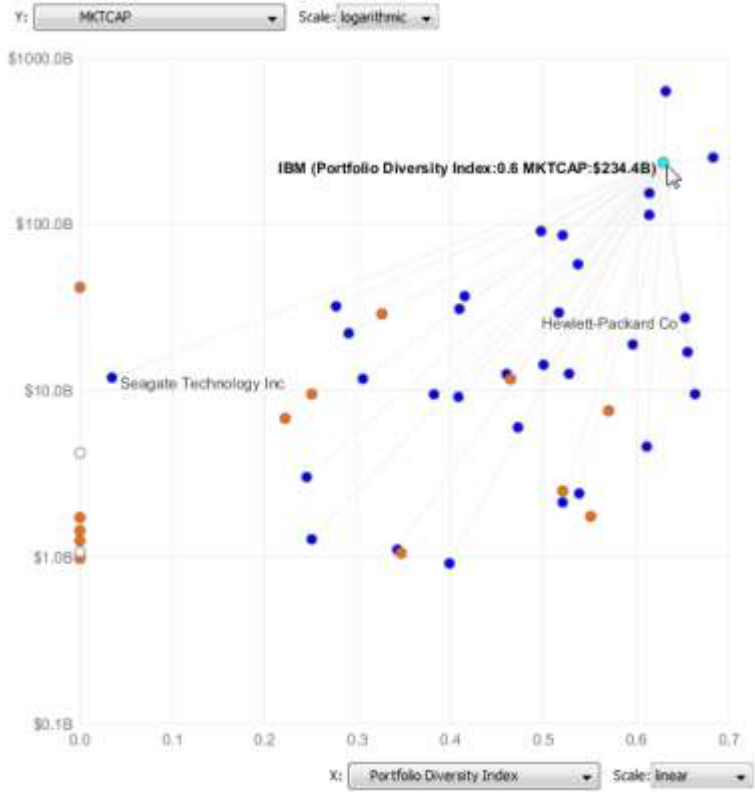
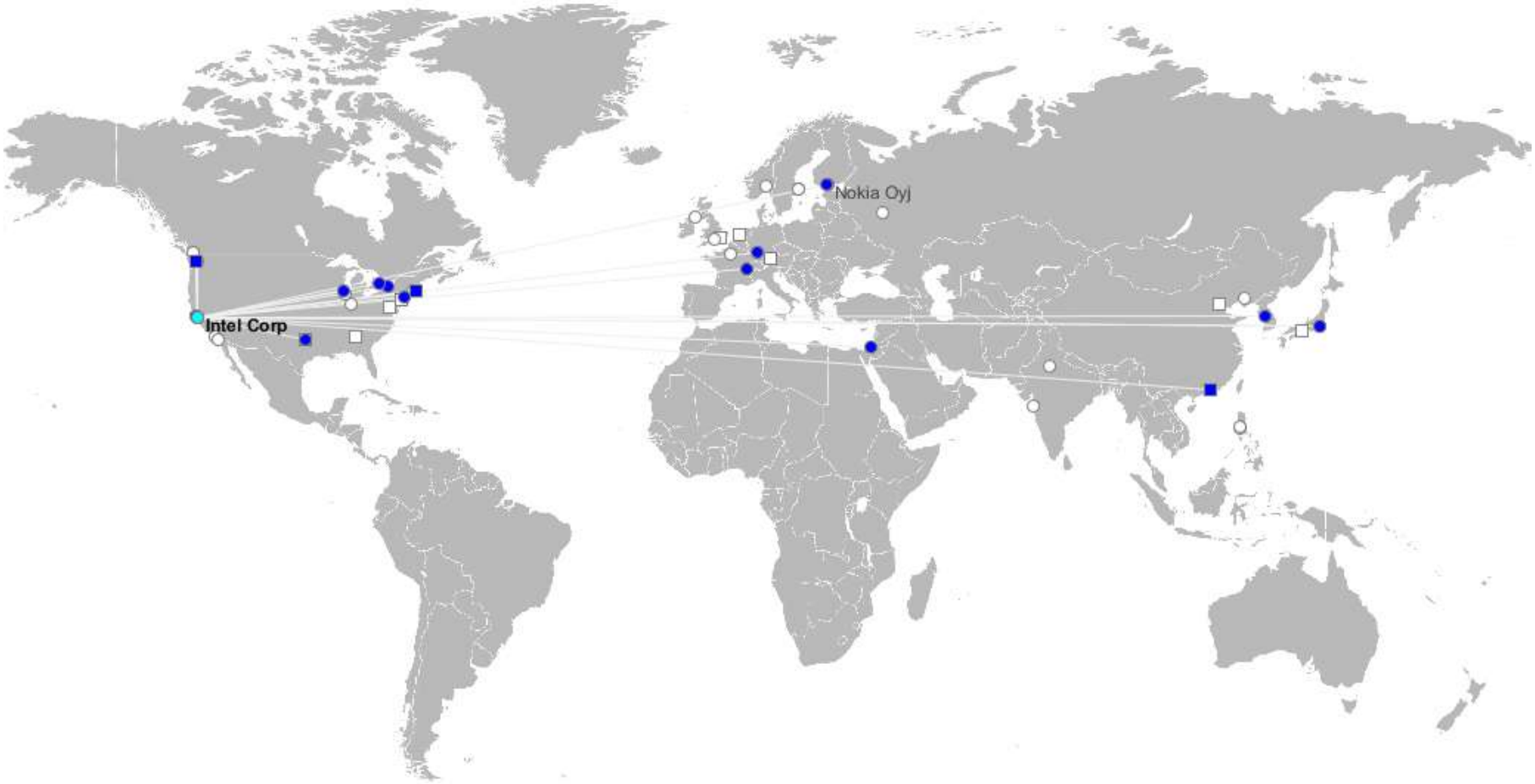
Photography & Digital Imaging
Media & Entertainment Providers
System Integrators
Hewlett-Packard Co
Seagate Technology Inc


Y: R&DEX
Scale: linear
$3000.0M
$2500.0M
$2000.0M
$1500.0M
$1000.0M
$500.0M
$0.0M
Intel Corp (Licensing:54 R&DEX:$2605.0M)
QUALCOMM Inc
Texas Instruments Inc
0
10
20
30
40
50
60
70
Texas Instruments
X: Licensing
Scale: linear


Y: MKTCAP
Scale: logarithmic
$1000.0B
$100.0B
$10.0B
$1.0B
$0.1B
IBM (Portfolio Diversity Index:0.6 MKTCAP:$234.4B)
Hewlett-Packard Co
Seagate Technology Inc
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
X: Portfolio Diversity Index
Scale: linear


Nokia Oyj
Intel Corp