开源的商业模式

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人们为什么参与开源?

- 兴趣，爱好/ 内在动机
- 声誉，资历
- 学习，锻炼能力
- scratch own itch, (有项目从开源发展到了闭源)
- 比赛，其他动机
- paid employee

公司为什么参与开源(做开源)?

- 获取开源软件的主导权/控制权
- 通过开源项目获得人才
- 拓展产品的应用范围（例如贡献driver到kernel）
- 公益整合，工业软件范畴：小伙伴联合对抗市场主流
- 提升公司声誉，
- 开源模式的吸引力：快速反馈和获得全球人才的贡献

商业模式

开源的商业模式

- Business models started in the late 1990s and early 2000s as "dual-licensing" models, for example MySQL. Many variations are referred to an "open core" model, where the companies develop both open source software elements and other elements of value for a combined product.
  - Oracle MySQL comes in various editions: MySQL Enterprise Edition is a commercial edition, hence to be purchased. The license is only offered as a subscription, named MySQL Enterprise Edition Subscription. The same applies for MySQL Standard Edition (MySQL Standard Edition Subscription) and MySQL Cluster CGE (MySQL Cluster Carrier Grade Edition Subscription). The other editions, such as the MySQL Classic Edition or MySQL Community Edition, are free to use with some restrictions. For instance, the MySQL Community Edition is a freely downloadable version, available under the GPL license and is supported by a community of open source developers.
- the Commercial Open Source Software Index (COSSI) track a list of commercial open source companies that have reached at least US$100 million in revenue. Notable examples include:
  - open core (sometimes referred to as dual licensing or multi-licensing),
  - software as a service (not charging for the software but for the tooling and platform to consume the software as a service often via subscription),
  - freemium (Give your service away for free, possibly ad supported but maybe not, acquire a lot of customers very efficiently through word of mouth, referral networks, organic search marketing, etc., then offer premium priced value added services or an enhanced version of your service to your customer base, Notable examples include LinkedIn, Discord),
  - donation-based funding, crowdfunding, and crowdsourcing (Popular examples for Crowdsourcing are Linux, Google Android, the Pirate Party movement, and Wikipedia).

$100M+ COSS Index: All Commercial Open Source Companies In History > $100M in Annual Revenue

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https://docs.google.com/spreadsheets/d/17nKMpi_Dh5slCqzLSFBoWMxNvWiwt2R-t4e_l7LPLhU/edit#gid=0

100% View only

A1 COSS Company

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	**COSS Company**	**FOSS Core**	**OSS License**	**Company Creation**	**Project Creation**	**OSS Origin**	**VC Raised (M)**	**Employees**	**Est. Revenue (M)**	**Est. Valuation (B)**	**Exit Value (B)**	**Status / Outcome**	**Exit Date**	**Sector**	**Business Model**
2	VA Linux (Geeknet)	Linux	GPL v2	1993	1991	Personal project	$30	300	$120	$0.2	$0.15	Acquired (Geeknet)	12/9/99	Computer Systems	Hardware Sales
3	Alfresco	Alfresco	LGPL v3	2005	2005	Company project	$70	419	$100	$0.3	$1.00	PE (Hyland)	9/9/2020	ECM <> BPM	Open Core
4	Kaltura	Kaltura	AGPL v3	2006	2009	Company project	$230	840	$170	$0.3		IPO	7/20/2021	Media Services / Video Cloud	Open Core
5	Puppet Labs	Puppet	Apache 2.0	2005	2005	Company project	$190	480	$150	$0.3		Private		Configuration Management	Open Core
6	Couchbase	Couchbase	Apache 2.0	2005	2003	Spin-out (LiveJournal)	$251	745	$130	$0.7		Private		NoSQL Database	Open Core
7	WP Engine	Wordpress	GPL v2	2010	2003	Personal project	$291	1120	$250	$1.0	$0.25	PE (Silver Lake)	1/4/2018	Content Management System	Open Core
8	SugarCRM	SugarCRM	Previously A2.0	2004	2004	Company project	$146	504	$175	$1.0		PE (KKR)	8/20/18	CRM	Previously Open Core
9	Acquia	Drupal	GPL v2	2007	2000	Personal project	$200	1,150	$200	$1.0	$1.00	PE (Vista)	9/24/19	Web Content Mgmt System	Open Core
10	Mirantis	OpenStack	Apache 2.0	1999	2010	Academia/Research (NASA)	$254	730	$100	$1.0		Private		Infrastructure Software	Open Core
11	Cloudbees	Jenkins	MIT	2010	2011	Personal project	$465	560	$100	$1.0		Private		DevOps / CI	Open Core
12	MySQL AB	MySQL	GPL v2	1995	1995	Company project	$41	800	$1,000	$1.1	$1.10	Acquired (Sun)	2/26/08	Relational Database	Open Core
13	Redis Labs	Redis	BSD-3	2011	2009	Personal Project	$356	800	$200	$1.1		Private		Database	Open Core
14	Treasure Data	Fluentd	Apache 2.0	2011	2011	Company project	$54	589	$120	$1.2	$1.00	Acquired (Arm)	8/2/18	Log Data Platform	Open Core
15	Mapbox	Mapbox GL JS	BSD-3	2010	2010	Company project (DevelopmentSeed)	$360	690	$100	$1.2		Private		Mapping Software	Open Core
16	Nicira	Open vSwitch	Apache 2.0	2007	2009	Academia/Research (Stanford)	$42	100	$2,000	$1.3	$1.26	Acquired (VMW)	7/23/12	SDN / Network Virtualization	Open Core
17	Fastly	Varnish	BSD	2011	2006	Internet-Scale (Verdens Gang)	$220	1,070	$370	$1.4	$1.45	IPO	5/17/19	CDN	Open Core
18	Canonical	Ubuntu	GPL	2004	2004	Company project	$12.80	1,100	$130	$1.5		Private		Operating System (Linux)	Open Core
19	Magento Commerce	Magento	OSL v3, AFL v3	2007	2008	Company project (Varien)	$272	700	$170	$1.7	$1.68	Acquired (Adobe)	5/20/18	Web Content Mgmt System	Open Core
20	Datastax	Cassandra	Apache 2.0	2010	2008	Internet-Scale (Facebook)	$343	760	$150	$1.7		Private		NoSQL Database	Open Core
21	ForgeRock	OpenAM/IDM/DJ/IG	CDDL	2010	2005	Spin-out (Sun)	$235	880	$200	$1.8	$2.00	IPO	9/16/21	Identity and Access Management	Open Core
22	Neo4j	Neo4j	GPLv3	2007	2007	Company Project	$518	762	$150	$2.0		Private		Graph Database	Open Core
23	Liferay	Liferay Portal	LGPL v2.1+	2004	2000	Company project	-	1,250	$300	$2.0		Private		Enterprise Portal	Open Core
24	Mozilla Corporation	Firefox	MPLv2	2003	2002	Spin-out (Netscape)	$22	1,580	$500	$2.0		Private		Web Browser	Ads/Royalties
25	Docker	Docker	Apache 2.0	2008	2013	Spin-out (dotCloud)	$443	490	$100	$2.1		Private		Developer Tools	Open Core
26	JFrog	Artifactory	AGPL v3	2008	2007	Company project	$230	1,240	$270	$2.3	$3.90	IPO	9/16/20	Software Artifact Repository	Open Core
27	Talend	Talend Data Integration	Apache 2.0	2005	2006	Company project	$145	1,610	$300	$2.5	$2.50	PE (Thoma Bravo)	7/28/16	SOA/ETL/AI/Middleware	Open Core
28	Sourcefire	Snort	GPL v2	2001	1998	Personal project	$40	600	$500	$2.7	$2.70	Acquired (Cisco)	10/7/13	Network Intrusion Detection	Open Core
29	Automattic	Wordpress	GPL v2	2005	2003	Personal project	$804	2,045	$400	$3.0		Private		Content Management System	Open Core
30	SUSE	Linux Kernel	GPL v2	1992	1991	Personal project	$12	2,172	$580	$3.1	$5.60	IPO	5/19/21	Operating System (Linux)	Support Subscriptions
31	Pivotal (Now VMware Tanz	CloudFoundry	Apache 2.0	2013	2009	Company project (VMware)	$1,700	500	$800	$3.5	$4.00	Acquired (VMW)	4/20/18	PaaS / Hadoop / Spring	Open Core
32	Instructure	Canvas	AGPL v3	2008	2011	Company project	$90	1,440	$460	$3.5	$2.70	IPO	7/22/2021	Learning Management	Open Core
33	Odoo	Odoo	LGPL v3	2005	2005	Company project	$315	2,380	$250	$3.5		Private		Business Applications	Open Core
34	Rapid7	Metasploit	BSD-3	2000	2003	Personal project	$89	3,000	$520	$3.7	$0.90	IPO	7/22/15	Security	Open Core
35	Rackspace	OpenStack	Apache 2.0	1998	2010	Academia/Research (NASA)	$750	7,800	$2,700	$5.0	$4.00	Private	8/4/20	Cloud Platform	Open Core
36	Cloudera	Hadoop	Apache 2.0	2008	2006	Internet-Scale (Google)	$1,350	3,300	$1,000	$5.3	$5.30	PE (KKR)	10/8/21	Big Data / Hadoop Ecosystem	Open Core
37	MuleSoft	Mule ESB	CPAL	2006	2003	Personal project	$311	3,000	$1,700	$6.50	$6.50	Acquired (Salesforce)	3/20/18	Middleware	Open Core
38	GitLab	Git	GPL v2	2014	2011	Personal project	$437	2,000	$300	$7.0	$11.00	IPO	11/14/2021	Distributed Source Code Version Control	Open Core
39	JetBrains	IntelliJ	Apache 2.0	2000	2009	Company project	-	1,900	$400	$7.0		Private		Developer Tools	Open Core
40	Confluent	Kafka	Apache 2.0	2014	2011	Internet-Scale (LinkedIn)	$455	2,500	$440	$8.0	$11.00	Private	6/23/21	Big Data / Middleware / Streaming	Open Core
41	Elastic	ElasticSearch	SSPL	2012	2010	Personal project	$120	3,200	$880	$7.4	$2.5B	IPO	10/5/18	Distributed Search Index + Tools	Open Core
42	GitHub	Git	GPL v2	2009	2005	Personal project	$350	4,660	$500	$7.0	$7.50	Acquired (Microsoft)	6/4/18	Distributed Source Code Version Control	Open Core
43	HashiCorp	Many	MPLv2	2012	2010	Personal project	$349	2,300	$275	$8.00	$14.30	IPO	12/9/2021	Developer / Ops / Infra Tools	Open Core
44	MongoDB (fka 10gen)	MongoDB	SSPL	2007	2009	Spin-out (10gen)	$311	4,600	$1,300	$23.0	$1.20	IPO	10/19/17	NoSQL Database	Open Core
45	Red Hat	Linux	GPL v2	1993	1991	Personal project	$15	19,500	$5,000	$34.5	$34.00	Acquired (IBM)	8/11/99	OS, Middleware, Infrastructure Software	Support Subscriptions
46	Databricks	Spark	Apache 2.0	2013	2010	Academia/Research (AMPLab)	$1,900	4,500	$1,000	$39.0		Private		Big Data / Hadoop Ecosystem	Open Core
47							**$14,819**	**92,666**	**$26,560**	**$214.4**	**$127.99**				

开源的商业模式

商业模式	简介	特点	代表企业
Support 支持服务	• 用户只需为技术支持及咨询服务买单	• 人工外包作，利润率偏低 • 工作可复制性低，scale较难 • 客户转换率低，通常<1%	Hortonworks redhat
Hosting 托管	• 供应商将其开源软件作为服务托管在云上，通过收取每月/每年的托管和服务费获利	• 该模式成为了部分云厂商打包开源项目赚取利润的途径	databricks Acquia
Restrictive Licensing 限制性许可	• 通过提供一个带有稍带限制的开源许可证来激励使用者进行付费	• 许可证定义模糊，需要法院判决 • 部分公司禁止使用该商业模式下的开源软件	redis neo4j
Open-core 开放核心	• 该模式下的大部分代码是开源的，而少数代码（针对企业用户）是专有的，需要收费 • 专有部分可以打包成与开源基础部分连接的单独模块或服务，或者在分叉版本中分发	• 该模式可以避免云厂商打包开源项目赚取利润 • 难以拿捏开源范围的尺度 • 很难将代码中的开源与专有特性完全分离	confluent cloudera
Hybrid Licensing 开放核心+混合许可	• 最新的模式，在开放核心基础上进行了改进 • 混合许可在同一个代码库中混合了开源代码和专有代码 • 用户可以选择只使用开源代码，或者同时使用开源代码和专有软件代码	• 代码在同一个代码库中，使管理和开发变得更容易 • 允许用户方便升级到付费模式 • 允许外部社区（比如GitHub）成员对专有软件功能模块进行改进	elastic Cockroach LABS

目前，开放核心+混合许可逐渐成为主流的商业模式，其原因在于：

- 开源软件商能够轻松管理代码库而不必拿捏开源的尺度
- 客户能够方便的从免费开源模式切换到付费模式（不需要额外部署，也不需要和销售人员沟通）
- 外部的开源社区也能对专有付费模块代码进行改进，降低了开发成本

来源：云启资本

四种主流的开源商业模式（知乎）

- 开源服务收费模式：指第三方开源供应商基于开源软件，以落地开源软件应用为目标，面向企业客户提供高质量的咨询、部署、安装、运维、安全等技术支持服务。此模式通常以按年收费的订阅形式获取收益。
  - 典型厂商：IBM。IBM是很多开源社区的创始成员和最高级别会员，也是很多开源项目和社区的肇始者以及战略支持者，包括Linux、Apache、Eclipse等。IBM基于其在开源领域的多年投入和积淀，为企业客户提供全方位的开源解决方案，如开源咨询和治理、开源架构和设计、开源开发和实施等服务。
- 企业发行版本收费模式：目前最常见、最成熟的开源商业模式，指开源厂商基于社区版开源软件（仅包含基础功能，免费）扩展差异化功能，并通过一系列适配、封装、测试，提供新的企业发行版本，企业发行版本为闭源产品，用户需付费购买。
  - 典型厂商：红帽。红帽的发行版收费模式已经十分成熟。红帽通过参与、集成、稳固三步法实现产品化，过去十几年间已经从企业Linux操作系统扩展到存储、中间件、虚拟化、云计算领域。
  - 参与：积极参与、创建各类开源社区上游项目，贡献代码。集成：对上游开源项目进行整合，提取出技术产品。稳固：对技术产品进行打包、检验、测试等二次开发，形成企业版产品进行销售。
- 云服务收费模式：指开源厂商将开源软件部署在云上，企业用户付费使用构架在云端的开源服务，无需执行搭建软件使用环境。这种模式通过上云可以覆盖技术能力相对较弱的中小企业客户，其本质是提供云服务（托管服务），因此，其开源主体主要为大型云厂商。
  - 典型厂商：亚马逊云、微软云、阿里云、华为云、腾讯云等，均提供主流开源软件的云服务，涵盖操作系统、中间件、数据库等领域。
- 生态流量变现模式：指开源厂商通过开源获取生态流量入口，然后利用流量进行变现。此类模式的开源主体一般为拥有高价值开源项目的巨头企业。
  - 典型厂商：谷歌、阿里云。谷歌开源安卓，通过售卖广告资源获取利润，每季度广告收入超过200亿美元；阿里开源OpenYurt，保留云原生的标准管控能力和接口，实现了阿里云生态的融合，推动了阿里云业务的发展。

目前比较成熟的开源软件商业模式（知乎）

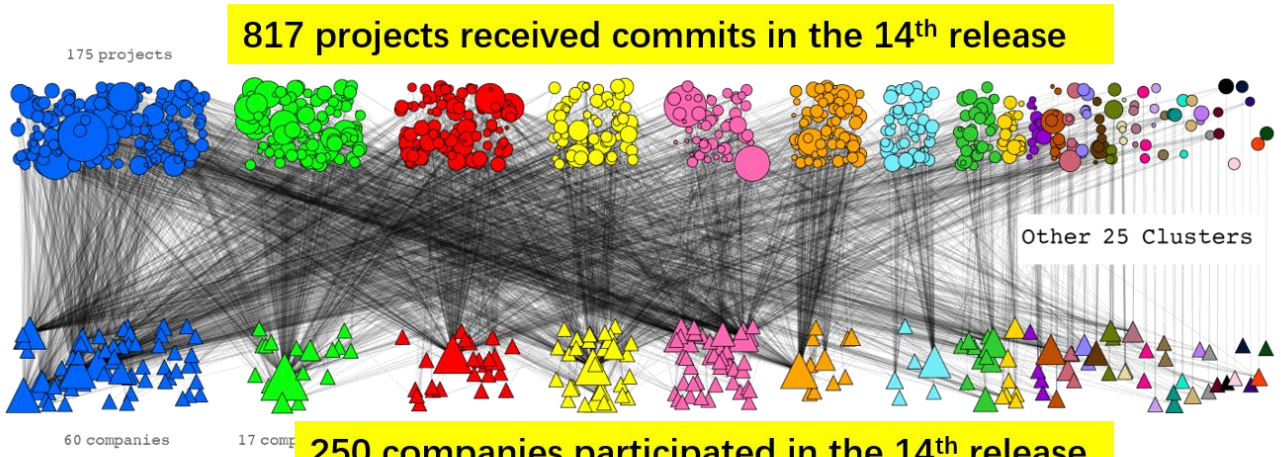
- 订阅服务：开源许可证免除了厂商对软件质量与软件缺陷修复的责任。而这些都是企业级应用所必须的。因此，最自然的商业模式就是提供软件订阅服务，从而向用户提供生产级的服务支持响应和 hotfix 修复。
- 高级功能：比如 Redis 。核心部分的组件是开源的。但工具类软件，进阶功能（如多租户，无共享分布式架构等）都是收费的。
- 云服务：比如 Databricks 。Spark 是开源的，但收费版本仅提供 Azure 和 AWS 上的云服务。
- 生态收益（仅限超大型开源厂商）：比如据华尔街分析师估算 Google 每年要支付近百亿美元给 Apple ，就为了 iPhone 上的默认搜索引擎入口。想想 Android 帮 Google 省了多少钱?

大规模开源项目中的公司参与：OpenStack

不同公司参与同一生态中的不同项目/模块的开发，公司间形成了基于模块依赖的关系网络。

OpenStack商业生态圈分类		
综合性IT巨头		IBM, Oracle, EMC, HP, Cisco, Huawei, FUJITSU,
硬件厂商		Quanta, Intel, NetApp, Seagate
公有云		Rackspace, HP, UnitedStack, Internap, Cloudwatt, Dreamhost
私有云	托管云	Metacloud, UnitedStack, Bluebox
	云软件(私有)	Piston Cloud, StratoScale
	发行版	Red Hat, Ubuntu, SUSE
	系统集成	Mirantis, Rackspace
OpenStack垂直组件	块存储	Inktank, SolidFire, StorPool
	对象存储	SwiftStack
	SDN网络	Juniper(Open Contrail), Nuage Networks, Plumgrid, Midokura, OpenDaylight, Cumulus, Big Switch, One Convergence
	数据库	Tesora, Galera Cluster
	计费	Talligent
	应用管理	Cloudify

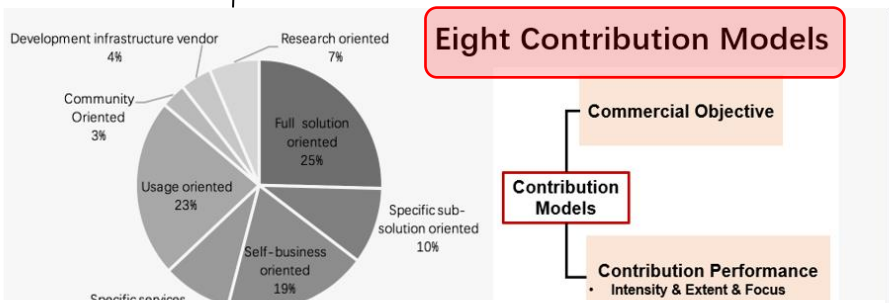
OpenStack 14th : 817code repo/34,192patch/2,439dvpr/250 Org



Three Collaboration Patterns:

- Intentional
- Passive
- Isolated

250 companies participated in the 14th release



Contribution Focus of the Eight Models

Eight Contribution Models

Four Types of Task Preference:

- Correction Focused
- Feature Focused
- Reengineering Focused
- Mainly Correction and Feature

Contribution Model	Contribution Focus
Full solution oriented	Computing
Specific sub-solution oriented	Storage
Self-business oriented	Networking
Specific services oriented	Documents
Usage oriented	Deployment
Community oriented	Infrastructure of development
Development infrastructure vendors	Infrastructure of development
Research oriented	Orchestration

Intentional collaboration:

- Supply and Consumption
- Distribution-oriented ally
- Service delegation

Rack space — Ansible — Walmart

Passive collaboration:

- Out of own interest
- Most common

HP — Magnum — CERN

Isolated collaboration:

- Plugins/drivers
- New services

Citrix — fuel-plugin-xenserver

Zhang et al. Companies'participation in oss development -- an empirical study of openstack. IEEE Transactions on Software Engineering, 2019.
Zhang et al. How do companies collaborate in open source ecosystems? ICSE'2020
Zhang et al. Corporate dominance in open source ecosystems: a case study of OpenStack. FSE'2022

Inflow and Retention in OSS Communities with Commercial Involvement

Zhou et al. ACM Transactions on Software Engineering and Methodology, 2016

Research Questions

- We select three hybrids to investigate:
  - What policies and actions did companies employ to get involved in communities?
  - What is the impact of the policies and actions?
    - Did they increase the inflow of new contributors?
    - Did they improve retention of existing contributors?

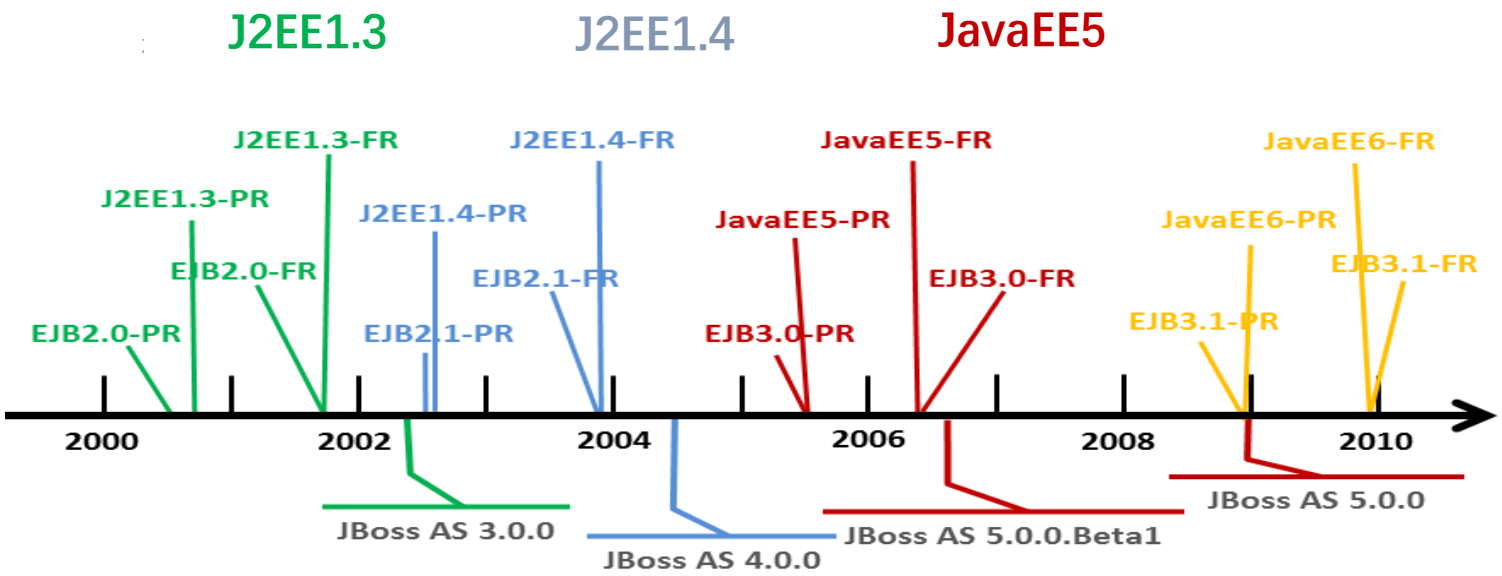
JBossAS：since 1999

Geronimo：since 1999

JOnAS：since 2003

Why these three JavaEE projects?

- **To control for variation inherent in software, we select three projects that develop the same specification in the similar time period.**
  - Control for external factors (economy, tech)
  - Control for context
  - We were a major contributor to one of the projects



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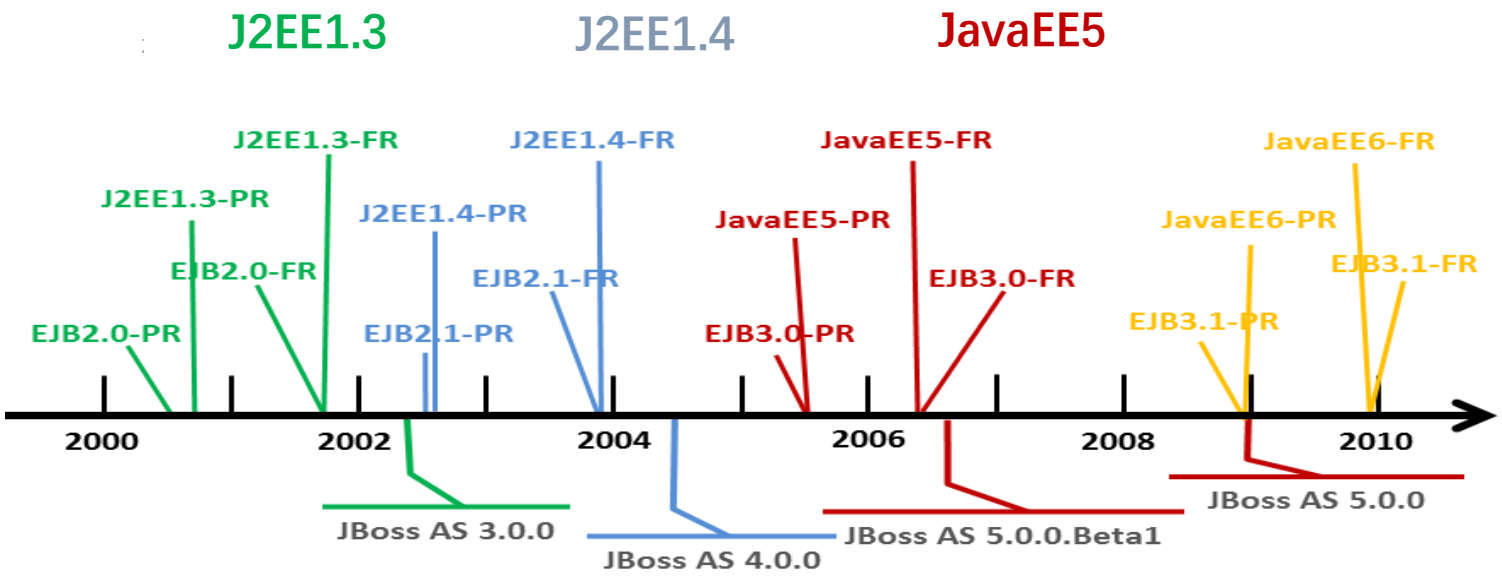


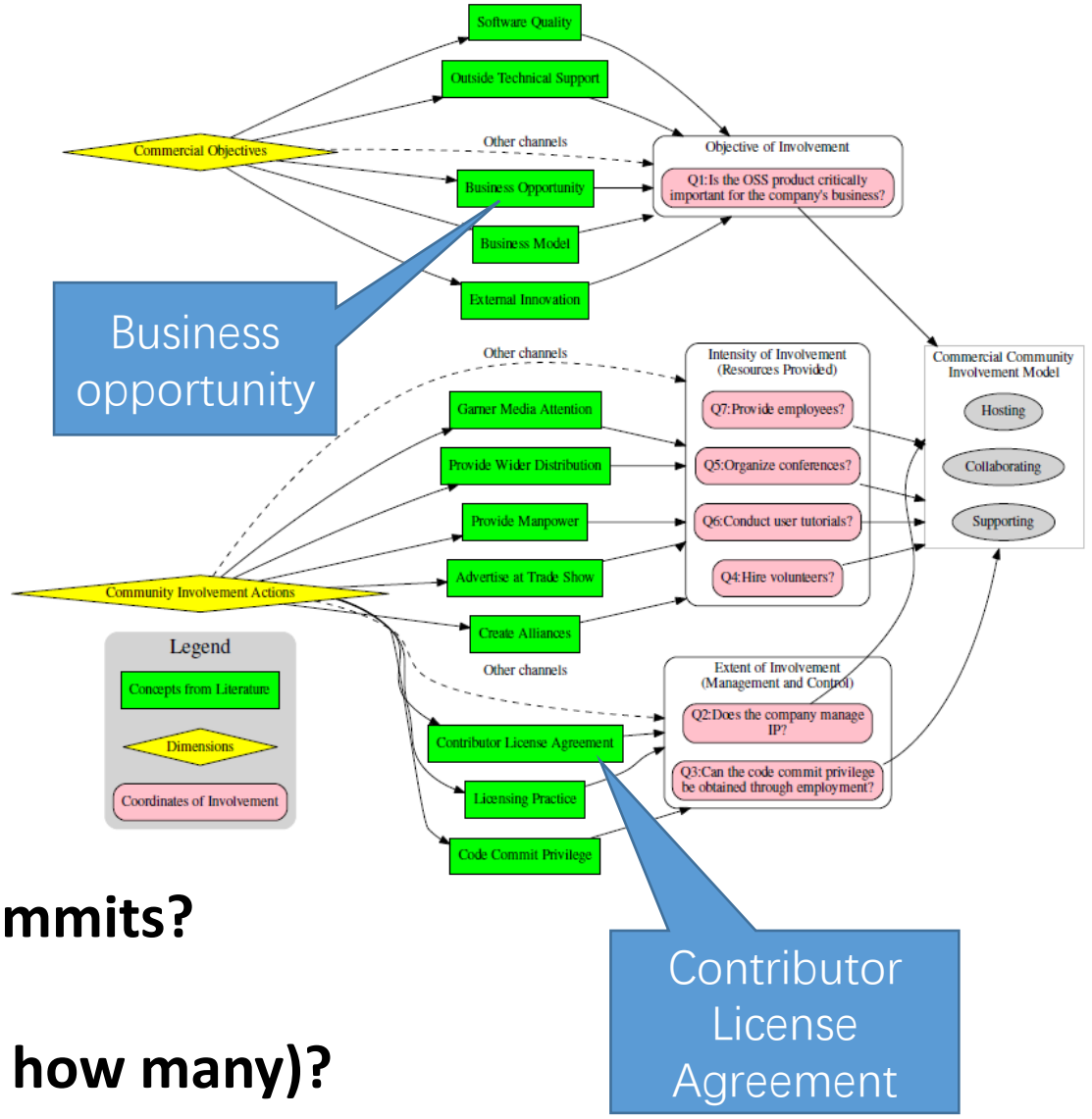
Two Dimensions of Commercial Involvement

Motivation:

Q1: commercial objectives?

Actions:

Q2: manage IP?
Q3: code commit privilege?
Q4: hire project volunteers?
Q5: organize conferences/summits?
Q6: conduct user tutorials?
Q7: provide employees (and how many)?



Q1: commercial objectives?

Bull on JOnAS: to gain profit indirectly through other commercial products.

IBM on Geronimo: to gain profit indirectly through the commercial products.

RedHat on JBossAS: to gain profit through subscription-based services.

Bull (JO)	General interest: To provide open source enterprise …eware solutions and support for the customers, and to adver…e the open source strategy for OW2. To gain profit indirectly through other commercial products.
Bull (JO.E1)	Specific Interest(SI) in E1: To develop its early version, through cooperation with several French organizations.
Bull (JO.E2)	SI in E2: To impleme… and to be effective at … velopers start buildin… own products.
Bull (JO.E3)	SI in E3: To implement JavaEE 5 and to develop … …tive version conforming to new specifications based on OS… …to cooperate … …den its … …ce. … …ption to … …f services and tools.
RHT (JB.E4)	To ensure the continu… an independent op… …ource application server and integra… as a division of RedH… To gain profit through subscription-based services.
IBM (GE.E2)	To support Geronimo and distribute a commercial …ommunity version based on it, and to obtain and test innovations transferable to the commercial products, e.g WebSphere. To gain profit indirectly through the commercial products.

Q2-7: community involvement actions?

Extent of Community involvement			Intensity of Community involvement				
Epoch	Management and Control		Resources Provided by Companies				
	IP Management Entity	Way to Be Committer	R1-R4*	Employees	Hire	Conferences	Tutorials
JB.E1	JBoss Org	Contribute	—	—	—	—	—
JB.E2	JBoss Group LLC.	Be employed+	Y	Y(15)	Y	Y	N
JB.E3	JBoss Inc.	Be employed+	Y	Y(30)	Y	Y	Y
JB.E4	RedHat	Be employed+	Y	Y(150)	Y	Y	Y
GE.E1	ASF	Contribute	—	—	—	—	—
GE.E2	ASF	Contribute	Y	Y(35)	Y	—	—
JO.E1	Bull, France Telecom, Lifl, INRIA	Contribute**	Y	Y(12)	—	—	—
JO.E2	the same as above	Contribute**	Y	Y(13)	—	—	—
JO.E3	Adding: SerLi, U of Fortaleza, Peking U.	Contribute**	Y	Y(15)	—	—	Y

Q2 Q3 Q4 Q5 Q6 Q7

Three commercial models

- Hosting: RedHat on JBossAS

  - Clear and strong commercial objectives
  - extensive resources, full control
- Supporting: IBM on Geronimo

  - Not directly related to revenue
  - Partial Resources, support project (control is on 3rd party)
- Collaborating: BULL on JOnAS
  - Not directly related to revenue
  - Partial resources, shared control

Epochs and Contrasts

- Each project underwent changes in commercial involvement, epoch represents constant
  - Compare the **similar epochs** in **different projects**
  - Compare **different epochs** within the **same project**

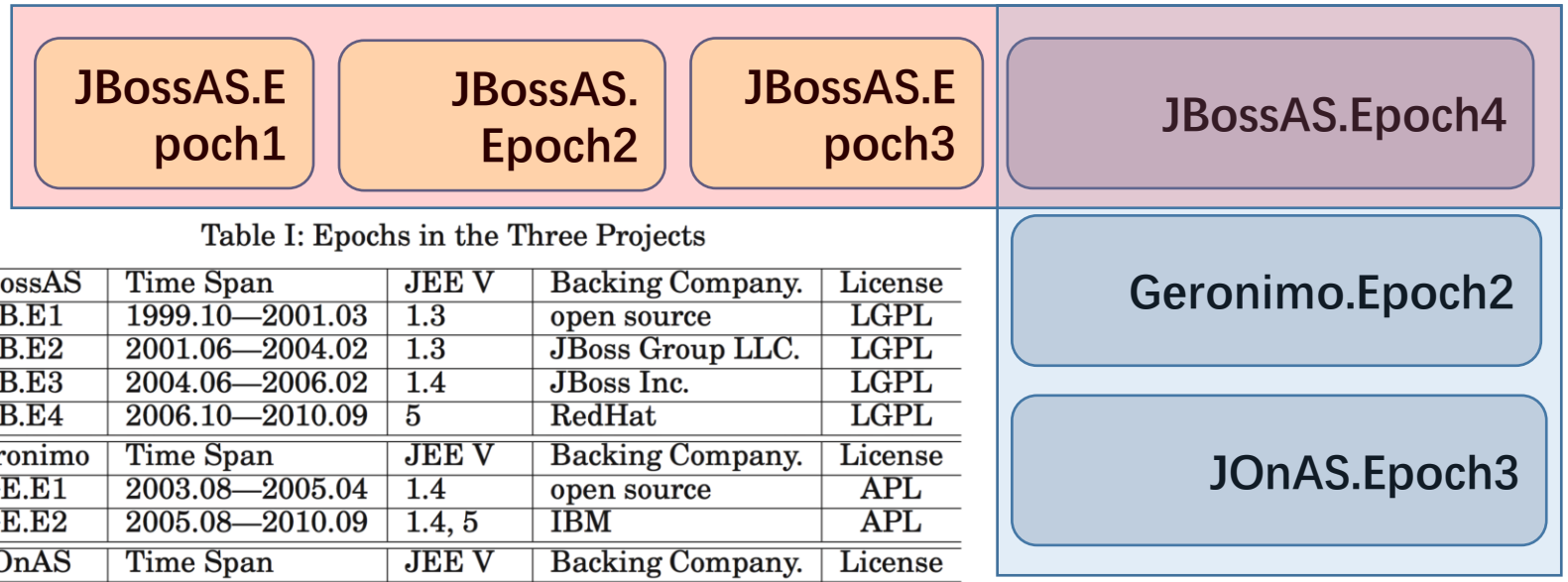


Table I: Epochs in the Three Projects

JBossAS	Time Span	JEE V	Backing Company.	License
JB.E1	1999.10—2001.03	1.3	open source	LGPL
JB.E2	2001.06—2004.02	1.3	JBoss Group LLC.	LGPL
JB.E3	2004.06—2006.02	1.4	JBoss Inc.	LGPL
JB.E4	2006.10—2010.09	5	RedHat	LGPL
Geronimo	Time Span	JEE V	Backing Company.	License
GE.E1	2003.08—2005.04	1.4	open source	APL
GE.E2	2005.08—2010.09	1.4, 5	IBM	APL
JOnAS	Time Span	JEE V	Backing Company.	License
JO.E1	1999.10—2004.03	1.3	Bull	LGPL
JO.E2	2004.06—2006.10	1.4	Bull	LGPL
JO.E3	2007.02—2010.09	5	Bull	LGPL

How different models affect number of newcomers?

JBossAS	Gernonimo	JOnAS
decrease	decrease	increase

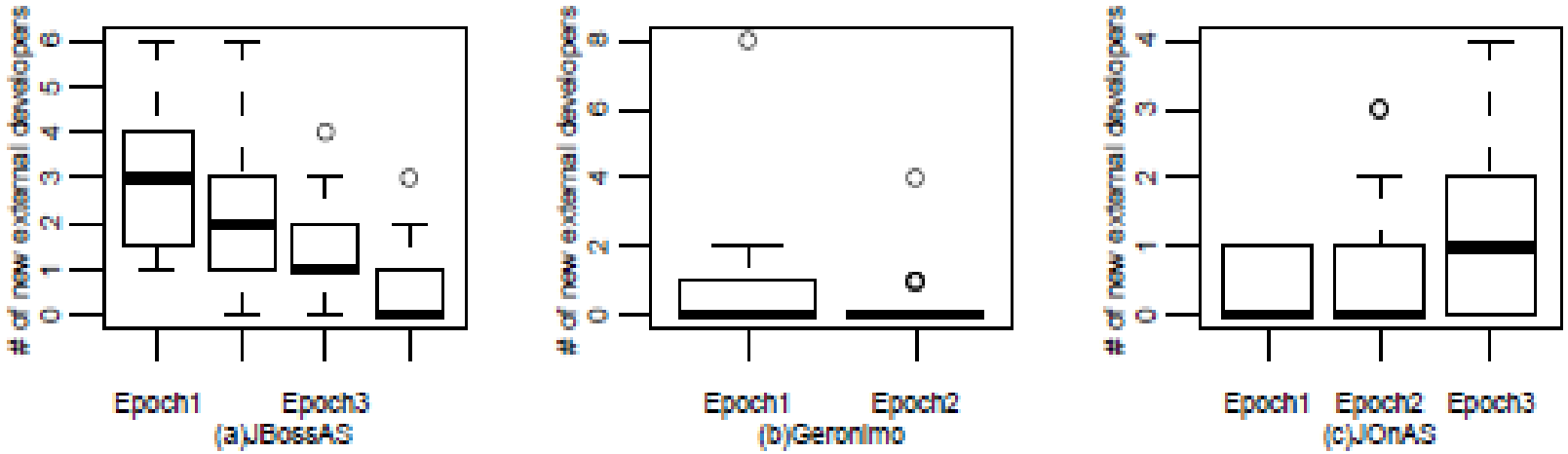


Fig. 1. Inflow of External Developers in JBossAS, Geronimo, and JOnAS

How different models affect contributor retention?

JBossAS	Gernonimo	JOnAS
increase	decrease	decrease

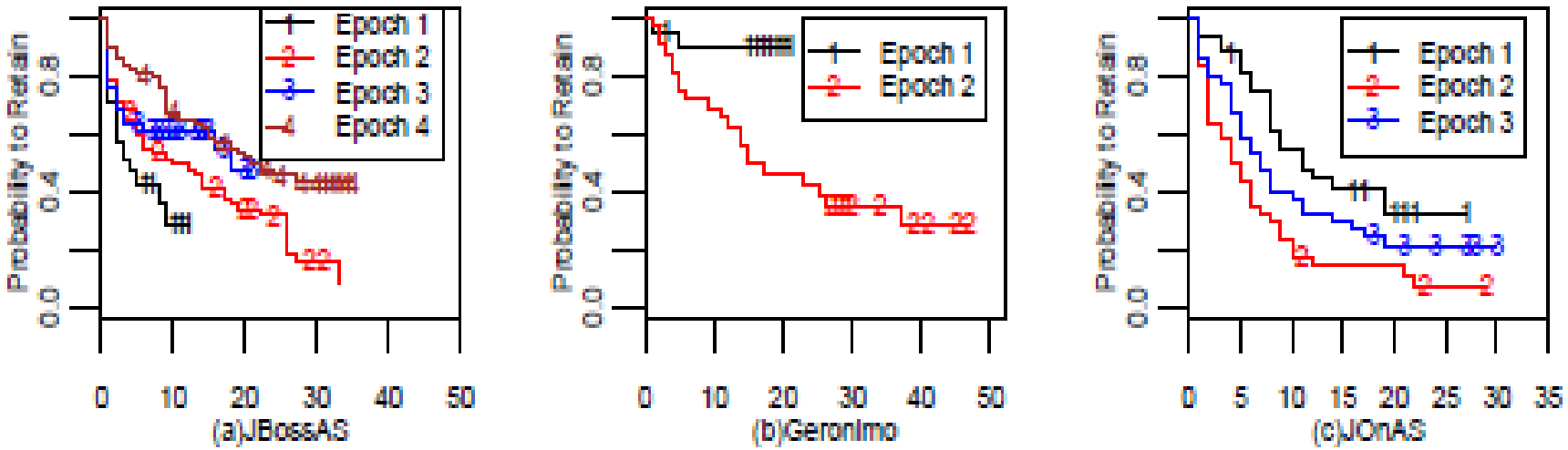


Fig. 2. Survival Curves of New Joiners in JBossAS, Geronimo, JOnAS each epoch

关于开源商业模式

- 要点:
  - 企业参与开源，必须要有商业闭环，才能持续
  - 开源商业模式有多种
  - 开源商业参与影响开源志愿者社区

- 课堂作业：每人选择一个公司和一个开源项目，在线搜索相关信息，然后阐述其开源商业模式（公司为什么参与这个项目，它获得了什么profit？）

End