数据分析驱动的决策与服务

Data Analysis Driven Decision-Making and Services
简介 Introduction
在历史发展长河中 In the long course of historical development
图书馆与时俱进、服务职能不断演进 Library keeps pace with the times and its service functions are constantly evolving

智能图书馆 Smart Library

传统图书馆 Traditional Library

数字图书馆 Digital Library

藏书楼 Book Storage

元者，善之长也。
亨者，嘉之会也。
利者，义之和也。
贞者，事之干也。
——《周易·乾·文言》
Main Tasks

Cultivating Talent

"Double First-Class" initiative

Teaching
Research
Innovation
Management
Culture

Quality Resources
Active Service

Library Service
服务甄选之容器解说

Container Explanation of Service Selection
(分层+分类)服务 (Layered+Sorted) Service
服务概况 General Picture of SJTU-Library Service

教学 Teaching & Learning
科研 Scientific Research
学科发展 Disciplinary Development
国际合作 Global Cooperation
文化激励 Motivating Culture
战略决策 Strategic Decision
教职员 Faculties 学生 Students
University Affairs University Activities

泛学科化服务体系 Ubiquitous Subject Service System
所有服务学科化，学科服务泛在化 All Services be Disciplinary, Subject Service be Ubiquitous

图书馆愿景 Library Vision
- 学术交流中心 Academic Exchange Center
- 知识加工中心 Knowledge Value-Added Center
- 文化传承中心 Cultural Inheritance Center

图书馆服务 Library Services
- 基础服务 Basic Service in Lib
- 扩展服务 Extend Service out Lib
- 步入实验室/办公室 Step in (Approach) Research Laboratory / Office
- 融入研究团队 Integrate into Research Team (Friends of Faculty)
- 嵌入研究过程 Embed in Research Process
泛学科化服务体系 (六大脉络)

Contexts of Ubiquitous Subject Service System (Six Aspects)

1. 走进院系主动服务
   Do Service Actively by Outreaching to Research & Teaching

2. 绩效资源分类保障
   Build Higher-Quality Collections Efficiently & Accurately

3. 嵌入课程支持教学
   Embed in Courses to Support Teaching & Learning

4. 融入科研辅助决策
   Integrate into Research to Support R&D

5. 触摸技术培育创新
   Inspire and Assist Students to Join in Innovation Practices

6. 科艺相通文化育人
   Cultivate Talents by Promoting Campus Culture
**Key Functions**

1. **Organize Subject Librarian Teams**
   - 服务无处不在：Service Not Only in Library But Also on Campus

2. **Train (Research Team Members as) Information Specialist**
   - 培训信息专员

3. **Build 12+4+X Subject Service Teams**
   - 组建12+4+X学科服务团队

4. **Contact with All Professors**
   - 遍访教授

5. **Collect Information & Opinion**
   - 征集意见

6. **Understand Needs**
   - 明确需求

7. **Send Service to Office**
   - 推送服务

8. **Has Visited 1180 professors till Now**
   - 累计拜访教授1180人

9. **Extend Service to Laboratory**
   - 拓展服务到实验室

10. **Expand Service Range**
    - 扩大服务范围

11. **Build Bridges between Library & Research Teams**
    - 在图书馆和研究团队之间架起桥梁

12. **Has Trained 1462 Information Specialists from Over 200 Research Teams**
    - 累计培养信息专员1462人，覆盖全校200余个科研团队
聚焦三方面  Focus on 3 Aspects

1. 顶层设计 Top Design
   - 三一原则：将资源建设的权力交给 Three-One Rule (or Trisection Unity Rule): To Give the Power of Resource Development to
   - 院系师生 Faculty and Students
   - 学科馆员 Subject Librarians
   - 采访馆员 Acquisition Librarians
   - 院系师生说了算 The Key Right belongs to Faculty & Students

2. 技术优化 Optimization via Technologies
   - 搭建电子资源分析系统 Build the Electronic Resource Analysis System (ERAS)
   - 开发动态映射分类专家系统 Develop the Automatic Mapping Classification Expert System
   - 构建期刊数据库评价模型 Establish the Journal Database Evaluation Model, etc.
   - ……

3. 先进理念与方法 Advanced Concepts & Methods
   - 引进需求驱动采购 Introduce DDA
   - 建立集团采购机制 Setup Group Acquisition Mechanism (eg. DRAA)
   - 构建资源地图 Construct Resource Map
   - 重组学科群资源 Re-Organize Resources According to Disciplinary Group
   - ……
Embed in Courses to Support Teaching & Learning

- Cooperate Extensively with Faculty
- Assist Course Instruction & Talent Cultivation

- Credit Courses: Annually 5 Courses
- User Driven Information Literacy Education
- User Demand-Directed Information Literacy Education
- Customized Training
- Micro Courses
- Assistance of Innovation in Teaching Model & Method
- Flipped Classroom
- Group Study
- Discussion & Presentation
- Group Learning & Study
- Ubiquitous Smart Class

- Embedded in Instruction:
  - Embed in 21 schools
  - Benefits More Than 9200 Students

- Learning Commons

- Flipped Classroom
- Interactive Sharing
- E-Reserved Book Services
融入科研 辅助决策 Integrate into Research to Support R&D

全面支持学科发展和管理决策的情报分析服务 Information Analysis to Support for Discipline Development and Management Decisions

- 学术成果管理与分析 Academic Output Management & Analysis
- 国际合作成效分析 Effect Analysis of International Cooperation
- 知识产权转移转化 Intellectual Property Transformation

- 院系管理决策支持 Assist Decision Making for School & Development
- 学科发展态势分析 Discipline Status & Trend Analysis
- 辅助学科评估 Assist Disciplinary Evaluation

- 创新团队和重点实验室的评估 Condition Evaluation of Innovation Team & Key Laboratory
- 辅助人才评估 Assist to Apply Talent Plan
- 定题服务、查新和查收查引 SDOI Service, Novelty Search
Inspire & Assist Students to Join in Innovation Practices

- Libraries Have Resources and Advantages to Support Innovation
- Focus: Cultivating Innovative Thinking & Manipulative Ability

在校学生 Students in University

学习 Learning

课程 Courses,  实验 Experiments,  训练 Practice...

图书馆 Library

院系、实验室 Schools or Colleges, Institutes, Labs, ...

创新 Innovation

观摩、创意活动、实验、试错 Observation, Creativity, Originality, Activities, Practice, Trial Error...

创业 Entrepreneurship

基金、探索、试点 Funds, Exploration, Pilot Project ...

感知 Perception

认知 Cognition

探知 Ascertainment

感知新技术 Technologies Perception & Achievements show

支持竞赛 Support Contests

支持教学创新 Support Innovation Lectures & Salons

创客空间 Library Makerspace

Data Analysis Driven Decision-Making and Services
Cultivate Talents by Promoting Reading Culture

Carrying Forward University Spirit, and Constructing Campus Culture

- **Create Reading Brand**
  - 鲜悦 (Living Library)
  - 交图 (SJTU Library) Series
  - 思源 (Thinking of Source) Series

- **Build Culture Base**
  - 李政道图书馆 Tsung-Dao Lee Library
  - 思源 (Thinking of Source) Pavilion
  - 交大-京东创客空间 SJTU-JD Maker Space

- **Popularize Science Lecture / Exhibition**
  - 领读者 / 书之道 Leading-Readership, Book Knows, …
  - 名师导读 / 大师讲坛 Famous Teacher / Master Lecture

- **Tsung Dao Lee Science and Art Workshop**
  - Tsung Dao Lee Science and Art Salon
  - Tsung Dao Lee Science and Art Lecture

- **Science & Technology**
  - Paintings, Photos
  - Student’s Products

Data Analysis Driven Decision-Making and Services

2019-06-04
**Principle**

- **Guided by University Strategy**
  - Prioritizing the pillar disciplines
  - Comprehensive focusing on fundamental disciplines
  - Supporting the featured and potential disciplines
  - Cultivating the new inter-disciplines

- **Top Design**
  - “Three-One Rule” (or Trisection-Unity Rule): To Give the Power of Resource Development to
    - Faculty and Students
    - Subject Librarians
    - Acquisition Librarians
  - The Key Right belongs to Faculty & Students

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**Three-One Rule**

- Faculty & Students
- Subject Librarians
- Acquisition Librarians

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**Data Analysis Driven Decision-Making and Services**

2019-06-04
Key Aspects

Enhance Quality to Support Teaching & Research
- Ensure core resources according to priority of discipline development policy
- Construct resources with departments to meet special needs

Lift Efficiency & Accuracy by building Analysis Platform
- Electronic resource analysis system ERAS
- Periodic database evaluation model Journal Database Evaluation Model
- Automatic mapping Classification Expert System
- Resources map Resources Map

Improve Benefits via Introducing Advanced Concepts & Methods
- Need-driven acquisition DDA
- Evidence-based acquisition ERA
- Cooperation acquisition Acquisition Consortium
以学校发展战略和师生需求为牵引，在智慧图书馆框架下，形成结构合理、重点突出、特色鲜明、类型丰富的满足学校发展的文献资源体系

Leading by university strategy and the needs of faculty & students, based on the frame of smart library, to build the collections with a reasonable structure, prominent emphasis, distinctive features and rich types.
案例分析 Case Studies
案例概览 Cases Overview

01 能源与矿业工程领域发展前沿分析 Frontier analysis of the development of energy and mining engineering
02 学科趋势/态势分析 Discipline Trend Analysis
03 国际合作分析 International Cooperation Analysis
04 学院发展定位分析 School's Orientation and Development Analysis
05 ESI潜力分析与监测 ESI Disciplines' Potential Analysis and Monitoring
06 高被引学者成长规律分析 Analysis of Growth Rules of Highly Cited Scholars
07 人才评估/评价 Assist Talent Evaluation

学科服务 Subject Service

资源建设 Collection Development

电子资源分析系统 Electronic Resources Analysis System (ERAS)
资源地图 Resource-Map
期刊数据库评价模型 Journal Database Evaluation Model
自动映射分类专家系统 Automatic Mapping Classification Expert System

数据驱动的决策与服务 Data Analysis Driven Decision-Making and Services
2019-06-04
Case 1: Frontier Analysis of Energy and Mining Engineering

Chinese Academy of Engineering

- Scanning the R&D Hotspots of Global Energy and Mining Engineering
- Discover and explore the cutting-edge key technologies
- Understand the global development trend
- Estimate (measure) the new development directions
- Provide reference for decision-making as a think-tank

Energy and Electrical Science, Technology and Engineering
Nuclear Science, Technology and Engineering
Geology Resources Science, Technology and Engineering
Mining Science, Technology and Engineering
Case 1: Energy and Mining Engineering Development Trends Analysis

**Method**
- Quantitative (Papers, Patents) analysis + Qualitative (Experts) evaluation

**Index**
- Citations
- Highly Cited Papers
- Core Papers
- Citing Papers
- Mean Publication Year
- Citation Velocity
- Consistently cited publications

**Results**
- Discovered Top 13 research frontiers from Journal & Proceeding papers
- Discovered Top 14 technology frontiers from Global patents
- Revealed the frontiers' development trends, technical characteristics, key layout countries, major competition institutions, and major researchers
Case 1: Energy and Mining Engineering

- The annual report “Global Engineering Frontiers” has been released globally by CAE for two years.
- Our research and analysis results about energy & mining engineering are adopted.
20世纪80年代后期高温超导的发现，在全球掀起了一股“超导热”。1980s: HTS became a hot research topic all over the world.

21世纪，中国的高温超导技术在超导材料技术、超导强电技术和超导弱电技术三个方面取得了重大进展和突破。21th: HTS research got great progress in China.

尤其在超导材料技术方面取得了重大进展和突破。especially in technologies of superconductive material.

高温超导技术广泛地应用到智能电网、交通运输、电子通信、医疗器械以及其它领域。Strategic Value in many Applied Areas: Smart Grid (Electric Power), Transportation, Communication, Medical Device, etc.
Case 2: 学科趋势/态势分析 Discipline Trend Analysis

目的 Aims

通过分析高温超导相关学科领域的发展状况和趋势、态势等 By analyzing the development status, trends and situation of HTS related disciplines

- 加强我校在高温超导领域的技术创新 To strengthen SJTU's abilities of technical innovation
- 提高专利转移转化的效率和质量 To improve the efficiency and quality of patent transfer of our university
- 为学校对高温超导重点学科领域的布局提供参考和建议 To provide references and suggestions for the layout of key disciplines of HTS in our university
- 为学校对高温超导领域的研究和产业布局提供战略建议 To give strategic suggestions for the research and Industrial Distribution of HTS in our university

方法 Methods

文献计量分析 Bibliometric analysis
内容分析 Content analysis
可视化分析 Visualization analysis

工具 Tools

- Web of Science
- Derwent Innovations Index
- Derwent Data Analyzer
- Citespace
- Excel
- ......
Case 2: 学科趋势/态势分析 Discipline Trend Analysis

- 通过对世界各国在高温超导方面发展政策的研究 By analyzing on the development policy of HTS in world’s developed countries
- 通过对全球期刊论文、会议论文和专利信息的检索、分析与可视化呈现 Through the retrieval, analysis and visualization of journal papers, conference papers and patent information
- 揭示全球高温超导发展的政策重点、核心研究主题及其演变轨迹、相关的专利技术、核心研究机构、核心研究者等, 向学校高温超导的研究和技术的产业化布局提出策略建议 To reveal the policy focus, core research topics and their evolution trajectories, related patented technologies, core research institutions, core researchers and so on for the development of HTS in the world

- 辉  

思路 Processing Way

该图展示了企业的资金和技术情况 The plot shows us that, the capital and technology situation of a enterprise

- 为交大在推进产学研合作上提供参考 So then, it can provide reference for SJTU in promoting the cooperation with industry
- 进而助力交大提高专利转化效率 And Help SJTU to improve the patent transfer efficiency
Case 2: 学科趋势/态势分析 Discipline Trend Analysis

报告显示，主要国家的优势技术领域分布和专利权人分布与区域技术发展的关联性很强 The report reveals that, the distribution of dominant technology & the distribution of patentees in major countries are strongly relevant with the regional technology development.

上海市科委对我们报告内容非常感兴趣 This aroused the interest of Shanghai Municipal Government

- 提出进一步分析上海市在该领域的发展态势、优势团队 The government entrusts us to make analysis of the Development Trend, Advantage Team in HTS area in Shanghai
- 进而为产业布局提供支持 So as to provide support for HTS industrial layout of Shanghai

重点对上海市自主拥有的知识产权的技术分布和专利权人分布等内容与国际、国内进行了比较分析 Focus on the comparative analysis of technology and patentee distribution of Shanghai's own intellectual property rights, at home and abroad

提交关于上海市高温超导技术研发布局调整的策略报告 Submitted a report, in which, the Strategic suggestions for the layout adjustment of HTS R&D in Shanghai are put forward
Case 3: 国际合作分析  International Cooperation Analysis

国际合作现状：100+ 合作伙伴  International Cooperation Status：100+ Partners

- 双硕士和博士课程 Dual Master’s and Ph.D. Programs
- 访问研究员/学者计划 Visiting Fellows / Scholars Program
- 联合研究实验室 Joint Research Labs
- 合作出版物 Joint Publications
- 访问学生科研实习计划 Visiting Students Research Interns Program
Case 3: 国际合作分析

Status Quo of International Research Cooperation

![Graph showing Wos Documents from 2012 to 2017]

- Breast cancer
- Alzheimer's disease
- Colorectal cancer
- Graphene
- Hadron-Hadron scattering
- Medical, Material, Physics
Case 3: 国际合作分析  International Cooperation Analysis

合作发文
Publications with Co-Author

篇均被引 (2012-2017)
Average Number of Citations Per Paper (2012-2017)

与U21机构的合作发文
Co-Author with U21:
28.35

所有合作发文
General Co-Author:
8.71

交大
SJTU (Only):
6.98

全球基准值
Global Baseline:
4.78
Case 3: 国际合作分析 International Cooperation Analysis

建议 Suggestion to University
- 优化国际合作方针 Optimize the international cooperation plan
- 建立一个聚焦于重点合作伙伴的联合种子基金 Set up a Joint Seed Funding which Focus on Key Partners

建立新的战略合作伙伴计划 SJTU Establishes a New Strategic Partner Program
- 采纳了图书馆的反馈 Adopted Library’s Feedbacks
- 3000万元/3年 A Funding of 30 Million RMB / 3 years
- 20个战略合作伙伴 20 Strategic Key Partners

优势互补 Complementary Strengths

交大？ SJTU’s Visibility

Joint Ph.D. Programs
Research Internship Programs
Joint Seed Funding
Establish Joint Research Centers or Joint Labs

......
Case 4: 学院发展定位分析  
School's Orientation and Development Analysis

目的 Why
1. 支撑学院国际评估  Support School in International Evaluation
2. 协助学院制定发展战略  Assist School in Making Development Strategy

概况 What
对标分析 Benchmarking analysis

参数：师资，科学技术研发投入 数值：Faculty, Science & Technology R&D Output

上海交通大学 Shanghai Jiao Tong University
- 电子信息与电气工程学院 School of Electronic, Information and Electrical Engineering

密西根大学 University of Michigan
- 工程学院电气工程与计算机科学系 Electrical Engineering and Computer Science Department, College of Engineering

斯坦福大学 Stanford University
- 工程学院电气工程系和计算机科学系 Electrical Engineering Department and Computer Science Department, School of Engineering
Case 4: School’s Orientation and Development Analysis

1. Faculty Situation Analysis
2. Academic Journal Articles Analysis
3. Academic Conference Papers Analysis
4. Highly Cited Papers Analysis
5. Patent Analysis

Method

Education Disciplines of the Chinese Ministry of Education

VS

Web of Science Disciplines of Web of Science

- Engineering, Electrical & Electronic
- Computer Science
- Automation & Control Systems
- Robotics
- ......
Case 4: 学院发展定位分析  School's Orientation and Development Analysis

1. 师资 Faculty
   给出师资数量和质量对标结果 Comparison result - quantity and quality

2. SCI, CPCI, ESI
   给出对标分析结果-发文活跃度、论文影响力、研究领域、研究合作情况等
   Analysis result - paper quantity, citation influence, research areas, research cooperation

3. 专利 Patent
   给出对标分析结果-技术领域和合作现状，专利授权和转让的数据分析结果
   Benchmarking result - technical fields and cooperation, patent authorization and transfer

结论 Conclusion

成效 Effects

1. 成功用于学院国际评估 Success in school's international evaluation
   发现优势，找出差距，量化对比结果，获得良好评估效果 Find advantages and gap, Quantify comparison results, Achieve good evaluation effect

2. 影响学校的发展决策 Effect school's development decisions
   报告被学校管理层接受，并被用于调整和制定发展决策 Report is accepted by school administrators, and is adopted in adjusting and making development decision
Case 5: ESI潜力分析与监测  ESI Disciplines’ Potential Analysis and Monitoring

**背景 Why**
1. ESI是评价学科或大学发展水平的重要指标之一 ESI is one of important index in evaluating the development level of a discipline or university
2. 这项工作能够促进学校的一流学科建设 This work can promote the construction of world-class disciplines

**概况 What**
1. 分析临界状态学科 Analyze disciplines to understand if it is in critical state
2. 提出策略建议 Propose strategic suggestions

**方法 How**
对标分析 Benchmarking analysis
具体指标有：标杆机构、作者分布、期刊发文、ESI高被引论文等 Include: Institution, Author Distribution, Journal Papers, Highly Cited Papers, etc.

**建议 Suggestions**
1. 推动跨学科交叉和研究 Promote interdisciplinary research
2. 关注相应学科人才队伍建设 Build discipline talent team
3. 拓展国内外交流与合作 Expand cooperation at home and abroad
4. 鼓励学者积极加入网络学术社区 Encourage scholars to join online academic community
Case 5: ESI潜力分析与监测  ESI Disciplines’ Potential Analysis and Monitoring

跟踪ESI指标，有效提升外文核心资源整体保障率
Track ESI indicators to guarantee discipline core resources

微生物 Microbiology
经济与商业 Economics and Business
精神病学/心理学 Psychiatry/psychology
成功进入ESI前1%
successfully entered ESI global top 1%

药理学和毒理学
成功进入ESI前1%
pharmacology and toxicology
成功进入ESI全球前1%
successfully entered ESI global top 1%

截至2019年共计监测19个学科进入ESI前1%
Till 2019, SJTU holds 19 ESI Global Top 1% Disciplines

*2016年起陆续进入ESI前1%的学科
ESI Global Top 1%
Microbiology, 2016
Economics and Business, 2018
Psychiatry/psychology, 2018

*2018年新增进入ESI全球前1%的学科
2018 ESI Global Top 1%
药理学和毒理学
pharmacology and toxicology
Case 6: Analysis of Growth Rules of Highly Cited Scholars

- Highly Cited Papers can reflect in large extent Academic Level of a scholar
- And, there exists Relevance with that the scholar becomes academic leader

- It becomes one of the focus point for many universities that
  - Discovering the growth rule (or Pattern) of Highly Cited Scholars
  - Furthermore, finding the way of training Highly Cited Scientists

- Our university entrusts library to do analysis of development rule of highly cited scientists on engineering area (Phase one)
Case 6: High Cited Scholars Analysis of Growth Rules of Highly Cited Scholars

**Data Source**
- 2017年和2018年工程领域入选高被引的242名学者 242 Highly Cited Scholars in Engineering area in 2017 and 2018

**Parameter Selection**
- 博士毕业年份 Education background: Bachelor, Master, Ph.D.
- 学术研究经历 Academic and research experience
- 合作依赖性 Reliance on collaboration
- 发文时间轨迹 The time history & Institute distribution for the publications
- 研究主导性: 引领、跟随、参与 Research dominance: lead, follow, participate

**Objective**
- 通过数据发现 To understand (based on analysis)
  - 学者学术生涯 Academic liveness of the scholars
  - 解析人才的活跃度、人才流动、合作聚类现象 Talent Flow and Collaborative Clustering situation
  - 不同类型学者的行为特征 Characteristics of researchers of different type
- 给大学提出学者发展模式的建议 Then, Give University suggestion of scholar development mode
**Case 6: High Cited Scholars Growth Rules Analysis**

- **Consulting Report**
  - Complete a consulting report (to university)
  - Concluded the development rule of highly cited scholars in Engineering Area in recent two years
  - Proposed the suggestions of tracking & training highly cited young talents

- **Analysis**
  - Analyzed the strength and crisis of the ranked scholars in SJTU
  - Revealed potential highly cited scholars of SJTU

- **Effect**
  - According to our conclusion, university introduced potential scholars and made training program for highly cited scholars
  - The highly cited scholars of SJTU grow obviously, this year
Case 7: Talent Evaluation

**Aim**
Support multiple evaluations for top talents.

**Point**
Research activity and impact.

**Method**
Set up an evaluation parameter model:
- **14 indicators**: number of papers, H-index, impact of papers, contribution to international cooperation, etc.
- Normalize to journal impact factor and cited impact factor to eliminate the effect of disciplines.
Case 7: 人才评价/评价 Assist Talent Evaluation

结果 Result

- 报告被采纳: Analysis Reports have been adopted by HR Dept. in
- 高层次人才聘期评价: Evaluations of Introduction of Top Talents
- 引进前的人才评估: Engagement Examination of Introduced Talents

成效 Effect

- 评估服务延伸至上海高峰高原学科建设计划: Evaluation Service be Extended to Shanghai Peak and Plateaus Discipline Construction Plan
- 制定高层次人才选拔标准: Making Selection Criteria of Top Talents
- 学科发展的学科分析及建议: Analyzing Situation of Discipline and Giving Suggestion for Discipline Development

评估超过700人（自2013年起）: Evaluated More Than 700 Persons (Since 2013 ~)
Case 8: 电子资源分析系统  

目的 Aims
- 核心资源保障分析 Core Resource Supportability Analysis
- 学科资源质量分析 Discipline Resource Quality Analysis
- 资源使用期刊分析 Resource Usage Analysis
- 资源成本效益分析 Resource Cost-Benefit Analysis
- 馆藏资源建设指导 Guide to Collection Development

思路 Processes

- 馆藏资源列表 Collection Resource List
- 核心资源列表 Core Resource List (JCR、ESI、BKCI)
- 馆藏资源列表 Collection Resource List
- 学科分类体系 Subject Category Systems (JCR、ESI、MOE)
- 馆藏资源列表 Collection Resource List
- 下载 Downloads
- 引用 Citations
- 下载 Downloads
- 引用 Citations
- 发文 Publications
- 价格 Costs
- 待定
- 馆藏资源列表 Collection Resource List
- 匹配 Matching
- 学科资源质量报告 Discipline Resource Quality Analysis Report
- 使用情况分析报告 Resource Usage Analysis Report
- 成本效益分析报告 Resource Cost-Benefit Analysis Report
- 匹配 Matching
- 匹配 Matching
- 匹配 Matching

电子资源分析系统通过自动收割、文献匹配和计量分析等方法，帮助图书馆把握订购资源的质量和绩效，优化馆藏建设策略。ERAS intends to review the quality and performance of purchased resources by automatic harvesting, document matching and bibliometric analysis, and further assist to optimize the library collection development.
Case 8: 电子资源分析系统  Electronic Resources Analysis System

应用效果 Application Effects

- 综合分析馆藏建设质量和效益，优化采购策略
  Assist to optimize the acquisition strategy based on the analysis of collection quality and benefit

- 发掘资源利用与科研产出的关系，强化资源对科研的支撑
  Enhance the supportability of resources to research by exploring and illustrating the connections between resource usage and research outputs

- 实现商业化应用，已有100多家用户
  As a commercial product with more than 100 users

图片展示了一系列的数据分析图表，包括成本效益分析、学科资源分析和高质期刊分析。
Case 9: Resource-Map

**Resource-Map** (RM) is a derivative product of the Electronic Resource Analysis System (ERAS), and it is a subject clustering and data driven multi-dimensional resource navigation system. All kinds of resources can be reorganized according to the subject categories of the Ministry of Education, therefore, the RM system can browse and position subject core resources easily.

**Features**

**Subject resource clustering**
- Classify all kinds of resources
- Cluster according to subject categories of MOE

**Refine resources with multi-angle**
- Filter resources by publisher, year, core resource list, etc.

**Reveal resources accurately**
- Provide accessible periods of resources, both current issues and back issues
- Offer links of accessible database directly

**Optimized resource ranking**
- Bibliometric guided ranking algorithm
- Based on impact factor, downloads, citations
Case 9: 资源地图 Resource-Map

面向用户 Functions for Users
- 聚类学科资源 Cluster subject resources
- 定位核心资源 Locate core resources
- 促进校内学术成果交流 Assist academic communication in university
- 支持科研全流程 Support for whole research cycle

面向学科馆员 Functions for Subject Librarians
- 掌握学科资源现状 Help understand collection status of subject resources
- 提供学科服务平台 Offer a subject service platform
目的 Aims

借助参数模型，综合评价期刊数据库
Comprehensively evaluate the journal databases via parametric model

为新订决策提供依据 Assist to make decision before purchasing

为续订决策提供依据 Assist to make decision in renewing

\[ S = w_1X_1 + w_2X_2 + \ldots + w_nX_n \]

思路 Processes

指标遴选
Indicators Selection

- 开展文献调研 Literature survey to get parameters
- 确定遴选原则 Selection criteria

权重设置
Weights Setting

- 层次分析法 Analytic hierarchy process
- 德尔菲法 Delphi

数据处理
Data Processing

- 比例型定量指标 Proportional quantitative indicators
- 非比例型定量指标 Non-proportional quantitative indicators
- 定性指标 Qualitative indicators

评分排序
Score & Rank

- 借助参数模型，客观、量化评估数据库价值，为是否订购数据库提供决策参考。 According to the parametric model, the values of a database could be objectively and quantitatively evaluated. [Include database introducing & renewing]
### 评价排名结果 Eevaluated Ranking Results

<table>
<thead>
<tr>
<th>名称</th>
<th>资源内容</th>
<th>功能服务</th>
<th>成本效益</th>
<th>总分</th>
</tr>
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<tbody>
<tr>
<td>PNAS</td>
<td>86</td>
<td>75</td>
<td>75</td>
<td>79</td>
</tr>
<tr>
<td>Oxford Journals</td>
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<td>61</td>
<td>79</td>
<td>76</td>
</tr>
<tr>
<td>Wiley Online Library</td>
<td>81</td>
<td>83</td>
<td>66</td>
<td>76</td>
</tr>
<tr>
<td>ACM Digital Library</td>
<td>78</td>
<td>67</td>
<td>69</td>
<td>72</td>
</tr>
<tr>
<td>SpringerLink</td>
<td>78</td>
<td>69</td>
<td>67</td>
<td>72</td>
</tr>
<tr>
<td>Nature</td>
<td>87</td>
<td>92</td>
<td>46</td>
<td>72</td>
</tr>
<tr>
<td>OSA E-journals</td>
<td>77</td>
<td>75</td>
<td>64</td>
<td>71</td>
</tr>
<tr>
<td>Annual Reviews</td>
<td>85</td>
<td>83</td>
<td>52</td>
<td>71</td>
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<tr>
<td>Royal Society of Chemistry</td>
<td>73</td>
<td>73</td>
<td>66</td>
<td>71</td>
</tr>
<tr>
<td>American Society for Microbiology</td>
<td>85</td>
<td>55</td>
<td>65</td>
<td>71</td>
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<tr>
<td>Science Online</td>
<td>86</td>
<td>49</td>
<td>66</td>
<td>71</td>
</tr>
<tr>
<td>Elsevier ScienceDirect</td>
<td>72</td>
<td>76</td>
<td>66</td>
<td>70</td>
</tr>
<tr>
<td>European Mathematical Society</td>
<td>74</td>
<td>64</td>
<td>27</td>
<td>53</td>
</tr>
<tr>
<td>Project MUSE E-journal</td>
<td>56</td>
<td>64</td>
<td>45</td>
<td>53</td>
</tr>
<tr>
<td>EBSCO Special Collections</td>
<td>38</td>
<td>57</td>
<td>64</td>
<td>52</td>
</tr>
<tr>
<td>AMS</td>
<td>71</td>
<td>51</td>
<td>31</td>
<td>51</td>
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<tr>
<td>ASTM SEDL</td>
<td>67</td>
<td>54</td>
<td>27</td>
<td>48</td>
</tr>
<tr>
<td>EBSCO ASC-BSN</td>
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<td>55</td>
<td>56</td>
<td>47</td>
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<tr>
<td>ProQuest ABI/INFORM Complete</td>
<td>30</td>
<td>45</td>
<td>64</td>
<td>47</td>
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<tr>
<td>EBSCO CMMC</td>
<td>50</td>
<td>57</td>
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<td>46</td>
</tr>
<tr>
<td>Gale Literature Resource Center</td>
<td>37</td>
<td>46</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td>EBSCO AAC</td>
<td>39</td>
<td>59</td>
<td>19</td>
<td>35</td>
</tr>
</tbody>
</table>

### 效果 Effects

- 基于参数模型综合评价所有50+期刊数据库 Evaluate all journal databases (50+ in our Library) based on parameter model
- 动态有效监控数据库绩效 Monitor the performance of databases dynamically and effectively
- 纵向追踪历年使用 Tracking the historical usage
- 横向比较数据库效益 Comparing the value difference among databases
- 评价数据库对教学科研的支撑作用 Measuring the role of a database in supporting teaching, learning and research
- 优化期刊数据库配置（末位淘汰） Optimize the compositions of journal databases (bottom out or last one eliminated)

### 采购决策 = 定量排名 + 定性评判

**Final Decision =**
Quantitative Ranking + Qualitative Judgement
Case 11: 自动映射分类专家系统  Automatic Mapping Classification Expert System

目的 Aims
实现外文资源分类自动化 To classify foreign literatures automatically
提高编目工作效率 To make cataloguing efficiently

思路 Processes
利用同现映射法建立映射关系表 Establish mapping tables by co-occurrence mapping method
一对一，直接获得分类 Get results if there exist 1 \to 1 mapping
一对多，基于专家知识和统计概率选择最优分类 Select optimal CLC from 1 \to n mappings based on expert knowledge or statistic data
无法映射，则提升上位类匹配，直至实现映射分类 Lift back to a superordinate category and re-make mapping classification by the same way

<table>
<thead>
<tr>
<th>LCC</th>
<th>DDC</th>
<th>Subject1</th>
<th>Subject2</th>
<th>Subject3</th>
</tr>
</thead>
<tbody>
<tr>
<td>123</td>
<td>456</td>
<td>Investment</td>
<td>Engineering</td>
<td>Physics</td>
</tr>
</tbody>
</table>

输入: DDC, LCC, LCSH
输出: CLC
Case 11: 自动映射分类专家系统  Automatic Mapping Classification Expert System

效果  Effects

1. 映射分类结果一致 Produce consistent classification results
2. 自动分类速度达200条记录/分钟 Receive efficient Mapping Classification result of 200 items/minute
3. 特别适用于电子资源分类 Suitable especially for classification of e-resource

应用  Applications

4. 系统实现商业化 A commercial system is developed
5. 被上图、南图、复旦、同济、华师大等应用 Adopted by many libraries, such as Shanghai Library, Nanjing Library, Fudan University Library, Tongji University Library, ……
结束语 Summary
图书馆服务的本质是要提供有价值、不可缺、受欢迎的服务，Valuable, indispensable and popular services are essential in a library service system.

泛学科化服务已成为上海交通大学图书馆服务体系的基本模式，SJTU library has built innovatively an Ubiquitous Subject Service System, which is the backbone of SJTU library service system.

数据分析驱动是上海交通大学图书馆服务体系中最重要的部分，极大提升了服务的质量和效率，Data Analysis Driven Services (Including Decision-Making & Collection Development) belong to the most important part of the SJTU Library Service System. It has boosted in improving the service quality and efficiency.

Ubiquitous Subject Service System (USSS)

**Contexts of Ubiquitous Subject Service System (Six Aspects)**

1. Do Service Actively by Outreaching to Research & Teaching
2. Build Higher-Quality Collections Efficiently & Accurately
3. Embed in Courses to Support Teaching & Learning
4. Integrate into Research to Support R&D
5. Inspire and Assist Students to Join in Innovation Practices
6. Cultivate Talents by Promoting University Culture
战略发展方向 Strategic Direction

通过数据分析参与决策，有效支持学校发展 We Have Received Success in Supporting University Development by Participating in Decision-Making and Services based on Data Analysis

未来，图书馆将持续积极参与学校发展的核心事务 For the Future Development, Library Should Actively Engage in Core Affairs of University Development

关键词 Keywords

- 转型 Transformation
- 超越 Transcendence
物竞天择，适者生存

It is not the strongest of the species that survives, nor the most intelligent. It is the one that is the most adaptable to change.

— Charles Robert Darwin