

## **Appendix B: Assessment Tools**

### **Information Economics**

Information economics provides a means to analyze and select technology investments. Information economics examines investments from both the perspectives of the business and technology domains. Examined in this method include the following:

#### **Business domain factors:**

- Return on investment (ROI) assesses the costs and benefits of a technology investment on other departments of the agency
- Strategic match (SM) assesses the degree to which the proposed project corresponds to established agency strategic goals. Projects that are an essential part of the corporate strategy receive a higher score than those that are not
- Competitive advantage (CA) assesses the degree to which projects create new business opportunities, facilitate business transformation, and improve agency's reputation or image
- Management information (MI) assesses a project's contribution to management's need for information about core activities that involve the direct realization of the mission versus support activities
- Legislative implementation (LI) assesses the degree to which the project implements legislation, executive orders and regulations
- Organizational risk (OR) assesses the degree to which an information system project depends on new or untested corporate skill, management capabilities and experience. Organizational risk focuses on the extent to which the organization is capable of carrying out the changes required by the project from both user and business perspectives.

#### **Technology domain factors:**

- Strategic architecture (SA) assesses the degree to which the proposed project fits into the overall information systems direction and conforms to open-systems standards
- Definitional uncertainty (DU) is a negatively weighted factor that assesses the degree of specificity of the user objectives, as communicated to the information systems project staff. Large and complex projects that entail extensive software development or require many years to deliver have higher risks compared to those projects segmented into modules with near-term objectives.
- Technical uncertainty (TU) assesses a project's dependence on new or untried technologies

Infrastructure risk (IR) assesses the degree to which the entire technology organization is both required to support the project, and prepared to do so. It assesses the environment, such as data administration, communications and distributed systems. A project requiring the support of many functional areas is inherently more complex and difficult to manage.

To evaluate each project, the portfolio planning team assigns a score ranging from zero to five for each domain factor and a corresponding weighting factor of zero to ten. The sum of the value factor scores multiplied by the factor weights constitutes the project value. The sum of the risk factor scores multiplied by the factor weights constitutes the project risks. In the example below, the total value score is 66. (ROI + SM + CA + MI + LI + OR = value). Risk score is 27. (SA + DU + TU + IR = risk)

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Factor	Business Domain						Technology Domain				Project Score	
	ROI	SM	CA	MI	LI	OR	SA	DU	TU	IR	Value	Risk
Score	4	2	0	4	0	3	4	2	1	3		
Weight	10	5	0	2	1	5	2	2	2	2	66	27

In this hypothetical example, the planning team placed the highest weight, 10, on ROI; and 5, or half the importance of ROI, on SM. They also rated the project high (4) on ROI because the project projected high labor savings. However on strategic match, the team assigned a score of 2 because it did not contribute significantly to the organizational goals. With respect to organizational risk, the team assigned a score of 3 because the operating division did not make adequate plans to integrate the new project into its operations. For each factor, the planning team sets a weight and assigns a score. In this hypothetical example, the total value score is 66 and risk score is 27. Applying this method to all proposed new projects, selection would be based on those receiving the highest overall value and risk scores.

### Federal Assessment Model

The federal model weighs costs, benefits and risks for proposed projects and scores them based on five categories: linkage to the business plan, mission effectiveness, organizational impact, risk, and benefit cost ratio. A total of 100 points are possible in the example. A range of points can be assigned depending on the relative value of the project in relationship to the category. In the example below, “link to business plan” is assigned a total of 25 points. Each project is scored from 0-25 depending upon the judgment of the portfolio steering committee (or other group of senior managers) rating proposed new investments or assessing existing ones.

Definitions of the categories and scoring criteria are provided below.

### Example of Ranking List of Technology Investments

Project name	Estimated project cost	Link to business plan 25 pts.	Mission effectiveness 20 pts.	Organization Impact 10 pts.	Risk 20 pts.	Benefit-Cost Ratio 25 pts.	Total Score 100 pts.
Proj A	800K	23	18	8	18	20	87
Proj B	620K	23	15	9	16	15	77
Proj C	582K	18	14	7	14	15	68
Proj D	500K	16	16	7	16	10	65
Proj E	1698K	15	18	6	9	15	63

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### Scoring Criteria

Each factor is assigned a maximum number of points to be awarded to projects that most closely meet the criteria. Scoring can vary from zero to the maximum allowed for each factor. Some of the examples give specific guidance in the allocation for points.

**Linkage to Business Plan** (25 pts.) The strength of linkage of the investment to the business plan. Scoring is based on documentation of need for the investment.

**Business Model** (7 pts. max.) Assess the degree of alignment with the business plan/priorities. Example scores:

Zero pts.: project does not support agency products/services or processes

1-4 pts.: project is specifically mentioned in business plan and supports agency products/services or processes

5-7 pts.: project is specifically mentioned in business plan and supports products/services or processes identified in the plan and the project has been coordinated with all organizational entities impacted by the project

**Level of Interest** (12 pts. max.) Assess the level of interest by agency senior managers, ISB and/or the legislature. Example scores:

Zero pts.: no expressed support for this project

12 pts.: strongly supported by senior managers, agency head, ISB and/or legislature

**Business Process Redesign** (6 pts. max.) Assess the degree the project enables the organization to do business in a better way. Example scores:

Zero pts.: automates an existing business process with little improvement of the process

6 pts.: enables significant improvement in way business is conducted.

**Mission Effectiveness** (20 pts.) Measure the impact of the system on both external and internal customers. Measure the project's ability to improve the performance of support or operational programs. Quantify the improvement if possible.

**Improve Internal Program Services** (10 pts. max.) Assess the expected improvement in service to internal customers. Example scores:

Zero pts.: does not appear to solve a problem defined by an internal customer. Little improvement in important customer service criteria, such as timeliness, quality, or availability is expected.

10 pts.: significant improvement expected in areas such as timeliness, quality or availability, and improvement is quantified. Improvement also addresses an important problem or area of service improvement defined by the customer.

**Improved Service to the Public** (10 pts. max.) Assess the expected improvement in service to the public. Example scores:

Zero pts.: project appears to provide little or no direct improvement in service to the public. Project makes a small improvement in timeliness, quality, or availability, but no documented need for such improvement is quantified.

10 pts.: project significantly improves service to the public in a mission where need is demonstrated or provides a new type of service to meet changing demands. Improvement is quantified.

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**Organizational Impact** (10 pts.) Measures the impact on technology personnel.

**Personnel and Training** (3 pts. max.) Assess the impact of the system on the knowledge, skill, and training of technology personnel. Example scores:

Zero pts.: project likely to require significant new skills to operate and support and project does not appear to mitigate this impact through appropriate training, or other personnel related remedies.

3 pts.: project is an improvement to an existing system and will require relatively little new skill and/or knowledge to operate or support. If project is new, it will introduce valuable new skills and knowledge to the organization and the project will mitigate any adverse impact through appropriate training, or other personnel related remedies.

**Scope of Beneficiaries** (4 pts. max.) Assess a higher score, the broader the scope of beneficiaries. Example scores:

Zero pts.: limited number of beneficiaries. Project will be used by only one office in the agency. Not a cross-functional system.

4 pts.: project is cross-functional and serves a number of offices, areas, and/or districts. Large number of organizational units will use project. Project will be used by the public.

**Quality of Work Life** (3 pts. max.) Measures the improvement in quality of work life expected. Example scores:

Zero pts.: little if any positive impact on the quality of work life. Project may increase work required.

3 pts.: positive contribution to the quality of work life. For example, project allows job to be done much faster and job satisfaction is expected to increase.

**Risk** (20 pts.) Measures the risk resulting from uncertainty, with a project that is totally lacking in risk scored 20. (The more risk carried by the project, the lower the risk score.)

**Schedule Risk** (4 pts. max.) Evaluate the probability this project can be completed on schedule. Score from 0-4 pts. based on where the project best fits on a scale from very risky to low risk. Example scores:

Zero pts.: very risky. Execution of project is likely to slip; acquisition strategy indicates contract may not be awarded on time to meet schedule or obligate budget year dollars. Project is understaffed and/or inexperienced and project is complex. Accelerated project schedule was imposed rather than developed from project planning.

4 pts.: low risk. Execution of project is not likely to slip; acquisition strategy should result in timely contract award such that funds can be obligated as planned. Adequate project staff is available and has requisite experience to execute the project; project complexity is documented. Project schedule has not been accelerated to meet artificial deadlines.

**Cost Sensitivity** (4 pts. max.) Evaluate the sensitivity or quality of the cost estimates. Example scores:

Zero pts.: very risky. Project is complex and cost estimates appear to require additional refinement. Software development is required and represents more than 50 percent of the predicted cost.

4 pts.: low risk. Cost estimates are well supported. Little software development required or a software cost estimating technique has been used to produce a reasonably reliable cost estimate.

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**Technical Risk** (4 pts. max.) Evaluate the risk to complete the system from a technical point of view. Example scores:

Zero pts.: very risky. Hardware and/or software solution does not conform to agency's technical architecture and/or there is little or no experience with this technology in the agency. Hardware, software, or support is not now available commercially and requires development specifically for the agency.

4 pts.: low risk. Planned hardware and software conform to organization's technical architecture and there is successful experience in using this technology in the agency. Hardware, software, and support are commercially available and do not have to be developed for use in the agency.

**Organizational Risk** (4 pts. max.) Assess the risk that the proposed system will fail due to organizational disruption. Example scores:

Zero points: very risky. Project implementation requires significant organizational change, process redesign, and/or people's jobs to be done differently and the project is not proactively seeking to mitigate this risk.

4 pts.: low risk. System has little impact on the organization or the project is mitigating this risk through training and/or investment in a business process redesign effort that builds commitment to the project.

**Risk of Not Doing It** (4 pts. max.) Assess the risk to the organization of not proceeding with project. Example scores:

Zero pts.: low risk. Project is incremental improvement to existing system. Impact of this project can be achieved by other means.

4 pts.: very risky. The project is important to provide future opportunities for cost savings and/or improved customer service. If system is not built or delayed for a year or more, the agency will probably fail to meet customer demands in the near future.

**Benefit-Cost Ratio** (25 pts.) Measures the value of the system in dollar terms. This ratio is developed using standard benefit-cost methods. Alternative methods to benefit-cost analysis include return of investment or net present value calculations. If using benefit-cost analysis, the higher the ratio, the better the score.

• Zero pts.	benefit-cost ratio less than one (costs exceed the benefits)
• 1-5 pts.	low benefit-cost ratio
• 5-20 pts.	medium benefit-cost ratio
• 20-25 pts.	high benefit-cost

### Balanced Scorecard

The balanced scorecard is a result-oriented planning and assessment approach that integrates the business, technology and financial planning processes. The balanced scorecard translates business strategies into technology objectives, measures and performance targets from the perspectives of the financial, internal business processes, customer, and learning and growth interests of the agency. Proposed new investments are assessed to determine which have the greatest value for achieving the objectives.

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The balanced scorecard addresses how well technology is:

- Achieving the strategic needs of the agency as a whole
- Satisfying the needs of individual customers with technology products and services
- Delivering quality products and services (effectiveness and efficiency of technology organization)
- Accomplishing ongoing technology innovation and learning

Objectives and corresponding performance measures are developed from four perspectives. By examining the resulting performance data, decision-makers can determine which projects have the greatest value for the agency.

### Achieving the Strategic Needs of the Agency as a Whole

In the chart below the performance of the technology portfolio is assessed for its contribution to the agency's strategic business plan.

Objectives	Sample Measures
Linkage to business mission, goals, objectives	<ul style="list-style-type: none"><li>• percent mission improvements (costs, time, quality, quantity) attributable to technology solutions and services</li><li>• percent planned technology benefits projected vs. realized</li></ul>
Portfolio analysis and management	<ul style="list-style-type: none"><li>• percent technology portfolio assessed and disposed</li><li>• percent applications retirement plan achieved</li><li>• percent reusability of core applications</li><li>• percent new technology investments vs. total technology spending</li></ul>
Financial and investment performance	<ul style="list-style-type: none"><li>• return on investment, net present value</li><li>• technology budget as percentage of operational budget compared to other agencies or the state as a whole</li></ul>
Technology resource use	<ul style="list-style-type: none"><li>• percent shared/consolidated resources</li><li>• percent cross-unit shared databases and applications</li><li>• percent hardware/software with interoperability capabilities</li></ul>

Agencies using these approaches believe consistency requires choosing an approach and conforming to it over time.

### Satisfying the Needs of Customers

This perspective is designed to assess the impact technology has on customer satisfaction. Some questions that can help to define the objectives include:

- How well are the business and technology domains integrated in the portfolio planning and selection process?
- Are customers satisfied with technology products and services?
- Are technology resources supporting major process improvement efforts?

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Objectives	Sample Measures
Customer/technology partnership	<ul style="list-style-type: none"> <li>percent projects using integrated project teams</li> <li>percent joint technology customer/supplier service level agreements</li> </ul>
Customer satisfaction	<ul style="list-style-type: none"> <li>percent customers satisfied with technology product delivery</li> <li>percent customers satisfied with technology problem resolution</li> <li>percent customers satisfied with technology maintenance and support</li> <li>percent customers satisfied with technology training</li> <li>percent products launched on time</li> <li>percent service level agreements met</li> </ul>
Business process improvement	<ul style="list-style-type: none"> <li>percent technology solutions supporting process improvement projects</li> <li>percent users covered by training to use new technology solutions</li> <li>percent new users able to use applications unaided after initial training</li> </ul>

### Delivering Quality Products

This perspective is designed to assess the ability of the technology organization to deliver quality products and services. Some questions to consider in developing the objectives:

- Are quality products delivered within general industry standards?
- Are quality products being delivered using acceptable methods and tools?
- Is our infrastructure providing reliable support for business needs?
- Is the enterprise architecture being maintained and sustained?

Objectives	Sample Measures
Applications, development and maintenance	<ul style="list-style-type: none"> <li>percent decrease in application software failures, problems</li> <li>average time to resolve critical defects</li> <li>cycle time for development</li> </ul>
Project performance	<ul style="list-style-type: none"> <li>percent projects on time, on budget</li> <li>percent projects meeting functionality requirements</li> <li>percent projects using standard methodology for systems analysis and design</li> </ul>
Infrastructure availability	<ul style="list-style-type: none"> <li>percent computer availability</li> <li>percent communications availability</li> <li>percent applications availability</li> <li>on-line system availability</li> </ul>
Architecture standards compliance	<ul style="list-style-type: none"> <li>number of variations from standards detected by review and audit per year</li> <li>percent increase in systems using architecture</li> <li>percent staff trained in relevant standards</li> </ul>

### Innovation and Learning

This perspective assesses the technology organization's ability to deliver quality results. Some questions to ask in developing the objectives:

- Do we have the right skills and qualified staff to ensure quality results?
- Are we tracking the development of new technology important to our business needs?
- Are we using recognized approaches and methods for building and managing technology projects?

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- Are we providing our staff the proper tools, training, and incentives to perform their tasks?

Objectives	Sample Measures
Workforce competency and development	<ul style="list-style-type: none"><li>• percent staff trained in use of new technologies</li><li>• percent staff professionally certified</li><li>• percent technology management staff trained in management skills</li><li>• percent technology budget allocated to training and staff development</li></ul>
Advanced technology use	<ul style="list-style-type: none"><li>• percent employees skilled in advanced technology applications</li><li>• number of dollars available to support advanced technology skill development</li></ul>
Methodology currency	<ul style="list-style-type: none"><li>• currency of application development methods in use</li><li>• percent employees skilled in advanced application development methods</li><li>• percent projects developed using recognized methods and tools</li></ul>
Employee satisfaction and retention	<ul style="list-style-type: none"><li>• percent employee satisfaction with the capability of the existing technical and operating environment to support mission</li><li>• percent employee turnover by function</li></ul>