



Center for Technology in Government

Public ROI - Advancing Return on Investment Analysis for Government IT *Case Study Series*

The Government of Israel's Merkava Project

**Anthony M. Cresswell
G. Brian Burke**

Center for Technology in Government
University at Albany, SUNY
187 Wolf Road, Suite 301
Albany, NY 12205
Phone: (518) 442-3892
Fax: (518) 442-3886
<http://www.ctg.albany.edu>

This material is based upon work supported by SAP. Any opinions, findings, conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of SAP.

© 2006 Center for Technology in Government
The Center grants permission to reprint this document provided this cover page is included.

This Page Intentionally Left Blank

TABLE OF CONTENTS

- Introduction 1**
- The Merkava Project 2**
- Context Factors 3**
 - Historical Context..... 3
 - Institutional and Political Context..... 4
- Initiation 5**
 - Vision 5
 - Technology Strategy 7
- Where It is Now 8**
- Delivering on the Value Proposition 10**
 - Direct Returns 10
 - Internal Returns 11
 - External Returns 12
- Implications for Public ROI Assessment..... 13**

This Page Intentionally Left Blank

Introduction

This case and the others in this series examine how government IT investments come to deliver value to the public, what we call public return on investment (Public ROI). The cases are part of a larger project to develop a new framework for assessing public returns to government IT investment. The results of these case studies and related research are featured in a white paper that presents the framework and recommendations for conducting public ROI assessment for government IT projects. All five case study reports and the white paper are available at CTG's Web site.¹

In the case studies we examine how the IT investment was conceived and developed, with particular attention to the role of public value in the process. We take the view that government IT investment generates public value two ways:

- By improving the value of the government itself from the perspective of the citizens, and
- by delivering benefits directly to persons, groups, or the public at large.

The first way is based on the idea that, assuming a benign government, the better it functions overall, the better off its citizens will be. The government is an asset to the community or nation that delivers a wide range of values. Internal improvements make it a more valuable asset to the public. The second way of generating value has three forms: financial, political, and social. Financial value results from lowering the cost or increasing the efficiency of government or delivering direct financial benefits to the citizens. Political value consists of increasing participation, fairness, transparency, legitimacy, etc., or conferring advantage to elected officials or citizens. Social and psychological returns include increased social status, relationships, or opportunities; increased safety, trust in government, and economic advantage. These general understandings of public value guide the data collection and presentation of the case results.

The case studies examine public returns to the overall IT investment, including returns generated by a government IT investment and the possible mechanisms to produce them. We do this by considering the links between investment goals, implemented systems, government performance, and public returns in terms of where they represent value in the chain shown in Figure 1 (below).

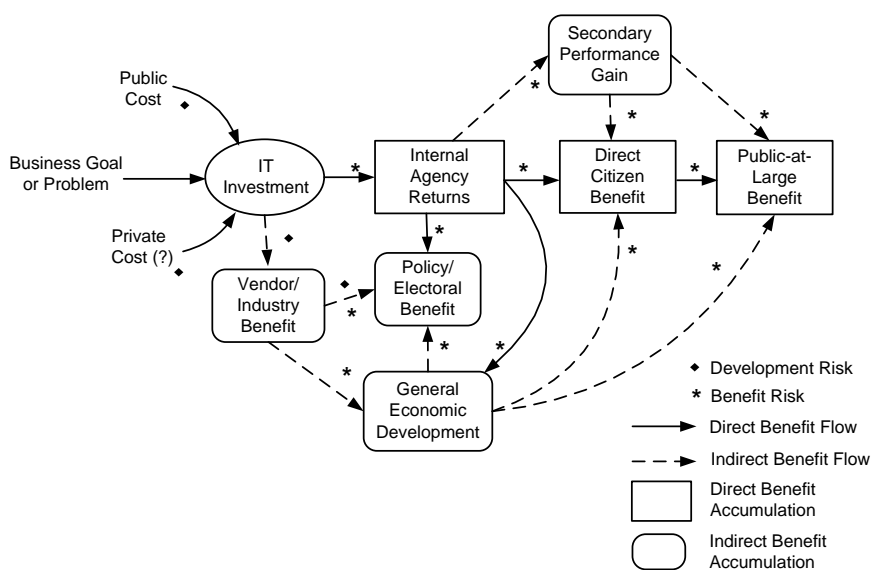


Figure 1. Public ROI Value Propositions

¹ View and download copies of the white paper and case study reports at www.ctg.albany.edu/projects/proj.

The public returns from the investment can flow from the internal improvements in the agency resulting in returns to individual citizens and the public at large (the main flow through the center). Other returns can flow to the political system and the economic environment (below the center), or through effects on other agencies (secondary performance gains). This general view of public returns informs the case studies and helps summarize the results.

The case studies were conducted through site visits and interviews with the participants in each project, combined with review of project documents and other evidence. We are indebted to the members of the Government of Israel and their IT teams, especially Yitshak Cohen, Ronny Jacobowitz, and Mor Sagmon for their generous assistance in conducting the case study and warm hospitality. The findings and views expressed in this report, however, are those of the authors alone and do not reflect the policies or views of the participants or the Government of Israel.

The Merkava Project

Some government IT initiatives focus narrowly on a specific technical problem, like enabling mobile data communication or Web-based transactions. Others are driven by a broader, more ambitious goal, to use IT as a tool to transform government. The Merkava Project in the Government of Israel (GOI) is most certainly one of these transformative efforts. It is transformative in its own right, as restructuring of the financial, logistics², and human resource components of government-wide administration into an integrated Enterprise Resource Planning System (ERP) system. But it is more than just a technology solution. The ERP framework is used as way to implement a much more standardized and modernized government operation; an enhanced management infrastructure on which to build improved services.

In that sense, Merkava is part of a comprehensive e-government initiative that includes the ERP system as one of five layers of new technologies and operational systems for enhanced internal operations and improved benefits and services to citizens. The layers build up from a government intranet (first layer) that supports the ERP (the second layer), plus a citizen connectivity (third) layer, with Web access, security, identification, etc., linked to the government portal (fourth layer), plus a fifth layer of support and distributed citizen access centers. These layers are part of a multi-year strategic plan, described in 2002 by Prime Minister Sharon: "The e-government project is an expression of the government goal to provide state-of-the-art strategic systems, while affecting social, and economic national targets. We believe that this infrastructure constitutes a better tomorrow and that tomorrow is already here." A detailed discussion of the entire initiative is beyond the scope of this case study. But it is important to examine how the design and implementation of the Merkava effort is linked to the larger initiative, since those links are part of the public value story. Those links and layers are described in a later section.

The essential part of the public value story that we focus on in this case is that of the Merkava ERP project as an integrative infrastructure. That is, achieving the larger public value goals of the GOI's e-government initiatives requires a new integrated infrastructure of information and management systems. The public value of the Merkava, therefore, derives primarily from its place as a strategic, integral part of that infrastructure. It is clear from the history of these initiatives that links between the public returns and the technology investment were well understood from the beginning. Nir Gilad, the Accountant General who initiated the ERP project in 1999, described the links in terms of the customers of the system:

"Who is our customer? The first one that we defined is ourselves. We are serving ourselves to maintain our capability to run the systems that we are in charge of. But very quickly we came to the decision that it's ridiculous to be building systems that are serving ourselves. So we came with the layers, and we say, 'OK, let's create the layers We create the layer I call

² In the Merkava and Government of Israel vocabulary *logistics* is equivalent to *procurement* and includes sales and maintenance, so the terms are used interchangeably in this report.

infrastructure, so we can connect and protect ourselves. Then we come with the layer that we do the e-gov [i.e., the services to citizens].”

It is also clear, however, that the full impact of the ERP initiative and ripple effects on services and other agencies was not fully anticipated. The spread of these effects through the government and into other areas of the society is part of the value story explored in the case.

From its beginnings in 1999 to the present, the Merkava ERP project has been a very large undertaking. It is described by the Ministry of Finance as the largest single IT project in Israeli history. Therefore this case study examines a project that’s well underway, but still short of full implementation. It has been implemented or is in the roll-out process in over 30 government units (out of 100), and currently supports approximately 2,300 users. The project cost estimate to date is NIS 800 Million.³ The 2005-2007 IT master plan calls for the Merkava system to be implemented in more than 90% of the government’s offices during the planning period. Work on the other four layers in the overall eGov initiative has been progressing in parallel with the Merkava implementation. The integration provided by the Merkava ERP provides an important part of the infrastructure for operations in the three upper layers of the initiative and contributes to the returns that they deliver, as well. The success of implementation efforts to date and the growing record of returns, both internal to the government and the public, suggest that the remaining roll-out will continue as planned and the accumulation of returns will continue to grow.

Context Factors

Historical Context

The impetus for the Merkava effort developed from a mix of conditions in the government and in the environment in 1998-99. Pressures for government reform grew in part from the effects of a deepening economic recession, dating from at least 1994, interrupted in part by a one-time massive infusion of IT investment in 2000. In addition, the threat of major computing and economic disruptions from possible Y2K problems prompted the government to suspend virtually all new computer system development in order to prepare for January 1, 2000. Internal financial reforms were hampered in part by the government’s accounting system. That was a cash-based central accounting system, dating from 1989, with limited functionality beyond basic bookkeeping. An attempt had begun earlier to implement a new accrual accounting system, but that project was not successful. And in general the government computing systems were not well suited for major reform. Separate systems dealt with logistics, human relations, and other cross-government functions with little or no integration of information among them. Individual Ministries had their own stand alone systems for their specific functions, with few data or process standards among the various units.

The national elections in May 1999, brought in a new government and provided a major impetus for change, in particular the project proposals from Nir Gilad, the new Accountant General (AG). Gilad had served in earlier governments, and was a private sector executive prior to rejoining the government in 1999. During his private sector tenure he had researched ERP systems and had developed a detailed knowledge of their potential for integrating information and transforming management operations. He wanted to shape government financial management, and ultimately all systems, into a much more integrated whole. The policy of the previous AG, suspending system development in preparation for the Y2K changeover, presented an opportunity to move in that direction. However, when Gilad took office in October 1999, there was good reason to believe that the Y2K preparations were largely complete. The government systems had experienced no major problems during the “mini-Y2K” test point on September 9, 1999.⁴ During the moratorium, a backlog of demands had accumulated from the agencies for new projects. To open a flow of funding to these existing plans and projects would be to continue building on

³ The current exchange rates for the New Israeli Shekel (NIS) is approximately 4.5 to US\$1.00.

⁴ On 9/9/1999 a four character date field would contain “9999,” which was also the end-of-file code in some software. Programs could act erratically at that point if the Y2K preparations were inadequate. The government computer systems passed that date with no major problems.

the old disconnected, limited systems. This would not deliver the kind of value available from greater integration or provide a foundation for service improvement.

Instead, Gilad and his team decided to continue the moratorium. They thought a possible ERP implementation would work to achieve their goals. However, once past January 1, 2000, the team would lose the justification for the moratorium. They decided that a vision, if clear and powerful enough, would be a workable substitute for the Y2K threat. As Gilad put it, "we used these drags [the moratorium] to create the Archimedic point to change the way that we're working Y2K was the explanation, now there's no explanation, so we have to come up with the vision. We created the vision, and a tender, and used it to make a landslide."⁵ That vision, known now as Merkava, along with the five layers, provided both the rationale and the overall design principles for the project and its relationship to generating public value.

Institutional and Political Context

The opportunity for this visionary strategy to be effective was in part a result of the current political and institutional context. The political context for initiating and sustaining the Merkava project is a complex one of continuity and change, due in large part to the Government's structure as a parliamentary democracy. Unlike the two- or three-party political structure of the US or UK, Israel has a multi-party system. The current Knesset (legislature), for example, includes members from 12 parties. It is unusual, therefore, for a single party to gain a majority of seats and form a single-party government. The resulting coalition governments are often unstable; the current government, elected in May, 2006, is the 31st since the formation of the state of Israel in 1948.

As with any long term project, the Merkava vision was at some risk due to changes in the government and political environment. The beginnings of the project date from the 1999 election that brought in a new government led by Ehud Barak as Prime Minister. He formed a seven-party coalition government, led by his Labor party, that took office in July of that year and appointed Nir Gilad as Accountant General. That government could not sustain the project, however, since the coalition did not hold, and Barak resigned in December of 2000. For the project to continue it would need the support of the new government formed by Ariel Sharon in early 2001, and a new Finance Minister, Silvan Shalom. Accountants General do not necessarily change with a new government, so Gilad continued in office and advocated for the ERP project.

The development team soon came to realize the scope and complexity of the project. They realized that strong support from the government would be necessary to achieve the changes on the scale necessary to implement an ERP. The head of the team, Yitshak Cohen, Senior Deputy Accountant General recognized the difficulty. "This was a Parliamentary decision. It's very difficult; it's an organizational project; it affects all the employees in the government. It's the heart of the organization," he said. Prime Minister Sharon was persuaded to support the project and the parliament approved it in late 2002. That government has remained in power, with Ministerial changes, through to the present. Sharon stood for election in 2003 and was re-elected, but was disabled by a massive stroke in January 2006. The then Deputy Prime Minister Ehud Olmert took over executive duties and was elected Prime Minister in May, 2006. Thus the Merkava initiative, begun through a change of government, survived three subsequent changes and the departure of the Accountant General who helped start it. More than five years later it continues with broad political support. When Cohen was asked how Israel was able to achieve such a massive reform of government, he replied, "We're small, we have a bureaucratic dictatorship, and we have chutzpah."

Sustaining the project was made possible in part by consistency in key staff positions and in multi-year planning. Despite the changes in governments, there has been more permanent participation and leadership in the initiative by professional staff as key players. As in any parliamentary system, with elected and usually temporary officials at the top, organizational continuity in ministries often depends on

⁵ The Archimedic point refers to a remark attributed to Archimedes: "Give me a lever long enough and a fulcrum on which to place it, and I shall move the world."

senior staff or contractors less affected by political shifts. For the Merkava project, the key persons in these roles have been Yitshak Cohen and Ronny Jacobowitz, a contractor who has had a major role in the project from the beginning. At the time, as head of the computer unit in the Accountant General's office, Cohen began work on elements of the e-government initiative in 1997, with the nomination of the governmental Internet committee and the initiation of the "Tehila" (connectivity layer) project. In 2002, the master plan was created and a government decision was made to allocate resources for the e-government services. The continuity has been sustained by these multi-year plans and statutory commitments. The Merkava project has been part of the 2003-05 and the 2005-07 strategic plans.

Formal plans and staff continuity, while important, are not sufficient to move such a broad and ambitious project forward. That requires political leverage within the organization. Political leverage is part of the institutional structure that puts the Ministry of Finance and the Accountant General in charge of agency budgets. With the authority of that office guiding the development and implementation of Merkava, there were powerful incentives for agencies to cooperate. As Nir Gilad put it, "Nobody wants to mess with the Accountant General; he's too powerful Not only does he have the power to make the decision, he has the power to enforce it." Of course, no one office has absolute power over budget decisions, and some ministries are larger and have more overall political status than others. The necessity to accommodate the needs of various agencies is reflected in some of the implementation strategies described in more detail below.

Of course the unique political and cultural position of Israel in the Middle East and world context are important parts of the institutional setting, as well. The changes in government described above were intimately linked to the Peace Process, according to news reports, and to the complex, ongoing conflict between Israel and the Palestinian and Arab interests in the region. As important as these conflicts may be in the overall political dynamic in Israel, however, direct influences on the design and implementation of the Merkava and the e-government initiatives were not apparent.

Initiation

The idea of the Merkava ERP as an integrating mechanism was part of the thinking from its beginning. The first planners and decision makers understood that much of the value and the power of an ERP as infrastructure derives from how it integrates both information and business processes. Obtaining that value depends on increasing information and business process integration across government agencies, which requires major interventions and can have powerful impacts on agency personnel and operations. It is potentially costly and disruptive.

Vision

A project of such potential cost and complexity would require a compelling vision. So part of the early planning included picking a name and logo for the project, shown here, to represent integration and power in a culturally meaningful way. The word *Merkava*, which can be translated as chariot, has deep religious significance in Jewish scripture as well as secular meaning and uses. The scriptural reference is to the vision of Ezekiel that includes creatures with four faces—a man, a lion, an eagle, and a bull—along with a chariot with complex wheels within wheels, all of which move in an integrated way.⁶ The initial development team was aware of the possible resistance to such major changes. So, they employed the logo and its larger meaning to reinforce the idea of a new shared identity for the project and those participating in it. According to Ronny Jacobowitz, "We were trying to



⁶ See Ch.1 of the Book of Ezekiel, Jewish Publications Society (<http://www.breslov.com/bible/Ezekiel1.htm#1>). Merkava is also the name of the Israeli Defense Force's main battle tank, a different sort of chariot.

push for a very clear message that says, we want to be together in doing this.”

The message appears to have been effective. This logo, developed at the beginning of the work, is used extensively in documents and presentations, reinforcing the distinctive identity of the project. Enthusiasm for the project was high among the early adopters interviewed for the case study. As Jacobowitz put it, “Some people may be against the team or things that are done wrong, but not against the idea itself.”

The metaphorical vision represented by the Merkava logo fits well with what emerged as the practical vision for the Merkava ERP and its place in the overall e-government initiative. Both involve the themes of reform, multiple components working in an integrated way, and multiple layers of complexity.⁷ The place of Merkava in that overall picture is as a layer of cross-cutting functions for all agencies: initially there was reform in the financial management, procurement, and human resource administration. Financial management goals focused on the conversion from a cash to accrual-based accounting system for all agencies, and one that would provide the integrated information base necessary for enhanced transparency, more efficient resource allocation, physical asset management, procurement controls, and more meaningful information for decision makers. Real estate asset management was added to the financial management component. These reform targets have substantial potential to improve the internal efficiency of government and the strategic position of the Merkava ERP in the overall e-government vision.

That overall e-government vision is represented in the five-layer model shown in Figure 2 below. The layers reflect their cross-government design, linking eventually across all agencies. The layers show a certain level of interdependency among the various system and infrastructure components. The capabilities in each layer form a foundation that the functions of higher layers depend on and interact with. The information sharing and integration capabilities of the Merkava.

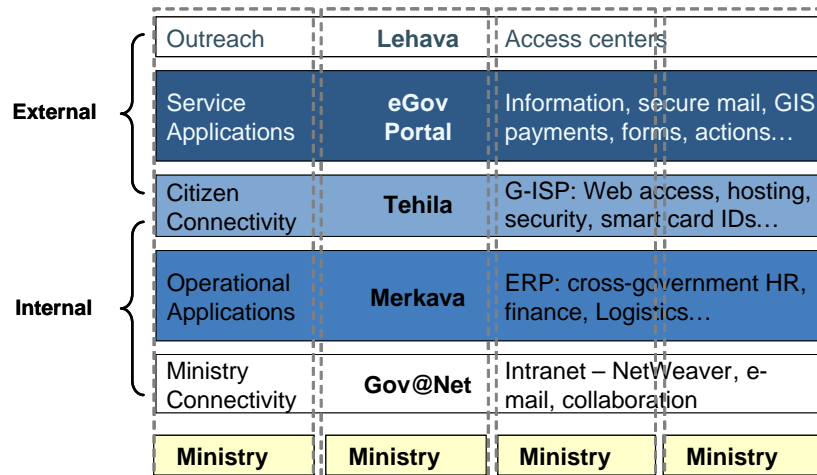


Figure 2. Five Layer E-Government Model

ERP, for example, depend on the connectivity provided by the bottom Gov@net layer. However, unlike the Merkava layer, the others are not single integrated systems, but rather combinations of applications, infrastructure, facilities, and devices like smart cards. As an overall vision, this model makes clear that the Merkava initiative and those in the other layers have been conceived of as parts of an interrelated whole. That is, the direct public returns anticipated from the service applications available through the eGov Portal layer and Access Centers depend on the successful investment in and implementation of systems in the layers below.

⁷ In fact the “wheels-within-wheels” theme is incorporated visually in a number of presentations about the project prepared by project staff.

However, at this point in the development of the Merkava ERP, the higher layer capabilities are not all linked to the Merkava operations and applications. For example, the e-procurement system works through the eGov portal and depends on the Tehila citizen connectivity layer, but is not fully integrated with the procurement modules in Merkava. Since these various systems are developed and come on line somewhat independently, the contribution of lower layers to public returns cannot be directly linked in every case to the service layers. This question of linking versus independently developed components is inherent in a comprehensive set of systems such as this and has not been fully resolved in this eGov initiative. This issue does not, however, diminish the public value case for the Merkava project as much as it illustrates the complexity of public value assessment for highly integrated government initiatives.

Technology Strategy

The overall e-government strategy places enhanced information access and integration, based on the Merkava concept, at the core. The overall goal, in the words of the e-government vision, is to create:

“A strategic solution enabling the government as a whole to perfectly harness information and knowledge resources in order to achieve an order of magnitude improvements in effectiveness, efficiency and service delivery.”

That is, the “information and knowledge resources” available to the “government as a whole” (integrated in Merkava) enable both internal and public returns. That internal efficiency-public return linkage is clear and consistent across the various strategy and goal statements dating from the initiation of the project in 1999-2000 to the present.

The path to achieve these goals, however, was not as clear from the start. To achieve these integrated and enhanced knowledge and information resources, the new system had to replace the several separate accounting, HR, and procurement systems in place in late 1999, as well as the separate asset management systems, with a common platform and capability to integrate data. Initially the development team thought the agencies with the best capabilities in each area should develop a system for the rest of the government: Police agency for procurement, Ministry of Finance for accounting, Human Resources Authority for HR, the Real Estate Authority for real estate asset management. However the team soon realized that strategy would not produce an integrated system. Instead they imagined a single system with integrated parts, like a wheel with spokes for each component. Since that image fit the Merkava/chariot vision, they began referring to the integrated components as the “ofan,” or wheel in Hebrew. The wheel would be the key component in the larger integrating and reform chariot, Merkava. One system for the government would be the only way to achieve the desired integration and interoperability, and the ERP model appeared to be the best technical option.

There was some resistance to this monolithic approach at first, but the goal of a highly integrated, consistent system remained the priority. So in May and June of 2000, the development team undertook a series of visits to assess the potential of that approach for their vision. The visits included ERP’s and similar systems at the UN, Germany, the Netherlands, and UK governments. The team was able to see the kind of potential benefits of an ERP system as the core component or ofan. That experience helped solve the build-or-buy issue. So they began developing a tender for acquiring the ERP system for the Merkava project. The tender was published in early 2001, seeking both the software components of an ERP and the related implementation support.

The tender produced proposals from SAP and Oracle, with the decision going to SAP plus implementation support from consultants. In addition to the various technical and cost considerations, the choice of the SAP proposal was driven in part by the strategic vision of using the ERP as a lever for major reform of the government. The development team described the SAP system as a conservative design, based on best practice models, that could be used to impose a high level of structure and conformity in use. This would require agencies and users to develop new work practices as well as to support information integration across agency boundaries. According to Ronny Jacobowitz, “We need a very closed system that forces us to work in a way that we’re not used to.” In explaining what he meant by a closed system, he said , “... not that the SAP product is not adaptable to our needs, but rather that it

leads us to use unified and best practice based business processes.” Based on these and other considerations the SAP proposal was selected. There was some delay introduced in moving forward with the procurement and implementation when Oracle challenged the decision in court. However the Israeli courts upheld the decision and implementation began in November 2001.

Obtaining the full range of value envisioned for the Merkava ERP depended on combined technical and organizational change strategies. Working alone, the ERP could generate substantial internal efficiencies. But delivering better service and value to the public, as part of the infrastructure of the e-government initiative, required broader changes. The full scope of the project included not only new technical systems and databases, but also shifts in organizational cultures, work processes, and internal power relationships and controls. Stakeholder participation and support were critical. To include the important stakeholders in project development, a ministerial level management committee was formed for policy and governance issues, and a steering committee of operational and technical managers for day-to-day issues. A project management office was created, under the direction of Ruven Cohen, with a staff that grew to 180, including trainers and developers. Several consultant firms were included as part of the development and support teams along with SAP personnel.

The overall implementation plan proceeded in several steps:

1. Development of the system templates, tables, and related system components that are consistent across agencies, began in late 2001;
2. pilot implementations in two Ministries (Science and Finance) to test the functionality of the systems and adaptation to special requirements, mid-2002 – 2003;
3. completion of Version 1 of the base system in August 2003;
4. sequential roll-out to the remaining ministries and agencies, underway and completed in 30 out of 100 agencies; and
5. implementation of the distributed architecture linking the Merkava ERP to the larger services and administrative environment, underway.

The initial implementation strategy includes recruiting key users in each agency to receive initial training, involving IT staff from each agency in the planning and roll-out, and involving SAP and other consultants as team members.

Part of the implementation strategy included keeping the amount of customization of agency implementations to a minimum to keep work practices and system interactions consistent and to control costs. Gilad jokingly described this practice, “We said for 70-75 percent, let’s convince God that you need something that’s not already integrated as a best practice in the SAP system. No, it’s God, it’s not me; it’s a sign from God that you probably don’t need it. It’s religious now, not only a systematic way of thinking.” This approach reduced customization. Where it was necessary, the project management staff developed standard interfaces and templates to connect specialized agency-level systems to the core.

The reform of work processes and requirements sparked by the implementation generated some staffing challenges as well. The conversion from cash to accrual accounting was critical for establishing the value of assets and improving financial management and transparency. However, the bookkeeping staff using the old system typically lacked the advanced accounting skills required for accrual systems. Considerable training and recruitment of staff with CPA-level skills was needed to fully implement the accrual system. Similarly, the new procurement system included an added control that automatically checks whether there is adequate funding for the purchases. If the check determines that enough funding is not available, it raises a “red flag” on the process. Controls were weaker in the old system where reviews of prices and procurement details were done manually. Thus the public value produced by increased transparency and legitimacy in financial management required a combination of new technology, new work processes, and new staff skills and relationships.

Where It is Now

The roll-out of Merkava to the entire government is well underway and is currently planned for continued development through 2009. The core ERP template has been implemented in 32 agencies and is underway in various stages in approximately five others. This template provides for integrated shared service for accounting and financial management, HR, procurement, and real estate asset management. The new financial management capabilities have resulted in greatly improved reporting and tracking of government spending and obligations. Also, the plan is to merge the Merkava ERP with hospital administrative systems for the 26 government hospitals and clinics, resulting in substantial efficiency and management benefits. The financial management capabilities of the Merkava ERP also support the operation of expanded online payment services for citizens and businesses. These and other returns internal to the government and to the public are described in more detail below. The general services implemented in the current template are shown in Table 1 below.

Table 1. Merkava Basic Services – Cross Agency				
Logistics	Financial	Human Resources	Property	Support Payments
<ul style="list-style-type: none"> • Procurement • Central tenders • Office tenders • Sales • Inventory Management • Projects • Maintenance 	<ul style="list-style-type: none"> • General ledger • Budget • Accounts Payable and Accounts Receivable • Asset Management • Bonds Management • Loans • Management accounting 	<ul style="list-style-type: none"> • Organizational structures • Employee file • Recruiting • Attendance • Vehicle allocation • Education • Budget auditing • Employee assessment 	<ul style="list-style-type: none"> • Designated property • Public housing • Government housing • Rent and hire contracts 	<ul style="list-style-type: none"> • Fellowship support • Authorities • Support for individuals • Inheritance and legacies • Research • Allotments • Religious institutes • Income insurance

Future development efforts in the Merkava project are now concentrated on the roll-out to the remaining agencies and the implementation of what is referred to as the distributed architecture. This latter effort involves an extensive list of objectives linking the Merkava throughout the government and with the public. The current development guidelines include:

- Moving to a Web interface with SAP NetWeaver compliance;
- compliancy to Service Oriented Architecture (SOA and SAP Enterprise SOA);
- integrating more SAP NetWeaver components;
- exposing Merkava internal services to all government and to the Web;
- adding a Disaster Recovery Planning site to Merkava;
- connecting Merkava to Gov.il in Tehila;
- supporting secured and semi-secured systems & raising security standards at all levels;
- enhancing technological supervision and auditing in Merkava; and
- developing internal support for Merkava and with SAP.

The development roadmap includes a major emphasis on Services Oriented Architecture (SOA) and SAP Enterprise Service Oriented Architecture (ESOA) as the bases for further linking and integration.

Overall, development appears to be moving along two main paths. The first is enhancing the internal application development and operational capabilities of Merkava and its technical environment (e.g., “Building complex business applications over existing applications without writing code”). This continues the process of building the internal, modernized infrastructure for government operations. The second path extends integration and interoperability externally to direct citizen service applications & operations through greater Web enablement and geographic distribution. These development paths are consistent

with the original vision for the project of building the internal capability of the government in order to enhance benefits to citizens and the society.

Delivering on the Value Proposition

A project with the scope of Merkava has produced numerous returns—both public and internal to the government—across a wide range of activities and government units. These returns are generally a mix of direct savings and efficiencies resulting from Merkava implementation, direct service improvements to citizens based in part on Merkava capabilities, plus strategic and political benefits resulting from Merkava integrating and handling information. This section focuses primarily on the public value returns in that mix along with a summary of the internal efficiency and operational returns.

Direct Returns

Much of the direct benefits to citizens results from lowering the cost of transactions with the government or providing information for new queries or transactions:

Financial transactions: Merkava provides a platform for back office processing of citizen and business transactions.

Payment Server – The public accesses the payments server online for most remittances to the government. The server connects directly to the government accounting system in Merkava and with banks and credit card companies. The payments can be made by credit card or direct withdrawal from bank accounts. The system currently processes approximately 120,000 transactions per month, with payments totaling NIS 4 Billion/year (10 percent of total collections). Over 30 percent of these transactions occur between 7-11 p.m., which indicates that the transactions formerly requiring citizens to visit government offices are shifting online.

The government does not collect data on the cost or staff savings resulting from the use of this payment system. However, the e-government system collects survey data on citizen satisfaction: a larger sample survey of 2,000 users quarterly plus a short satisfaction survey at the end of each transaction. The surveys show high levels of satisfaction (over 90 percent) and help identify problems or areas for new development.

Procurement Server – The e-government program established a procurement server to support online reverse auctions for purchasing. Qualified vendors receive a tender and instructions for participating online. The auction is open only to registered vendors who submit bids and see the current pricing. New bids can be submitted at will until one stands for a pre-arranged length of time (e.g., 30 minutes), closing the auction. The second use of this server was underway during the site visit, allowing the study team to observe it in action for a PC procurement in real time. During the observation time, the offered price for the PC order worked downward rapidly, ending at less than ½ the previous price for comparable equipment. This server is not yet linked directly to the Merkava procurement module, so measurements of returns are not yet available.

Information transactions: These include government obtaining information from citizens, via forms, and individuals seeking information from the government.

Forms Server – A forms server allows citizens and organizations to submit information to the government by completing applications and other government forms online. The forms server is not currently integrated with Merkava. Merkava provides value for citizens and organizations seeking information about financial transactions, both in terms of transparency about government decisions and about the status of specific claims or subsidies. These include vendors seeking status of orders and payments and citizens

seeking status of payments due or eligibility for grants and subsidies. The e-government program also plans to implement a secure authenticatable email system to replace registered mail. This would lower the cost to citizens of obtaining or submitting legal documents. This is not currently linked to Merkava but represents another public return that can eventually be linked through the ERP infrastructure. Savings to the government or citizens from use of these services has not been documented.

The connection between service delivery through the e-government program and the Merkava project is made complex by the large scope of both, the many possible connections between them, and the difficulty of coordinating diverse development activities. The e-government program is organizationally separate from the Merkava project, but still within the Ministry of Finance and under the authority of the Accountant General's office. At present e-government focuses primarily on the services mentioned above plus an internal government portal for secure internet access from government computers and a secure intranet for agencies. These are primarily front-office services, on the interface between the government and its customers, or the infrastructure that directly supports those services. Merkava is the back-office system for the internal operations of the agencies. The back-office foundation will eventually link to direct services, as some do now. In the interim, however the development paths will be partially independent. Thus the full value of Merkava as an external service delivery platform has yet to be realized.

Internal Returns

The plans and descriptions of the Merkava project describe a substantial list of internal returns and strategic advantages to be obtained. The claim for the project is that both service quality and greater internal efficiency and effectiveness will flow from integrated information, improved controls, better input for decisions, and more accountability and transparency. Evidence for improved overall efficiency, while sparse, is impressive: elimination of 143 legacy systems during the roll-out to less than one-third of the agencies and a reduction of 45 percent in overall IT expenditures. At the agency level, however, there is limited evidence on how these managerial and operational improvements play out. Fortunately, there has been some detailed analysis of the impacts in one of the largest roll-outs, the Ministry of Health. This analysis provides a useful model of the kinds of impacts that may be found generally.

The Ministry of Health is responsible for 26 government hospitals and clinics as well as health policy, disease prevention, health research, and related functions. It was one of the early Merkava implementation sites. The Ministry's report of the positive impacts of the Merkava ERP on internal operations is summarized below.

Strategic Advantages:

1. Improved information for decisions; improved control and supervision; manager access to analyses without staff assistance; top executives have overview of operations not previously available.
2. Provides accounting detail by unit and activity beyond gross categories in budget statutes.
3. Ability to aggregate budget detail across units for comparison, standard setting, monitoring, and performance assessment. This includes monitoring laboratory performance and grants management.
4. Process integration reveals connections across units and activities and opportunities to improve efficiency and detect waste. For example, the logistics system showed a supplier was also a client of the government, allowing for offsetting payments in the amount of NIS 1.8 Million.
5. Tools for increased tax collection, such as reminder letters and label printing with debt data.
6. Accounting for assets, income and expenses on the accrual basis provides obligations transparency and better budget control.
7. Foundation for improved citizen service by connection with payment server.

Tactical Advantages:

1. Preservation of investment in unique systems for emergency inventory and reserve management to work with the SAP-ERP system.
2. Improved decentralization and delegation of authority for lower ranked tenders.

3. Standard procurement system allows monitoring across departments.
4. Combined tracking of department budget reserves and inventory.
5. Unified data and language supports faster updates of policies and business rules.
6. Expanded capability to manage both internal and external work force.
7. Provides income analysis of remote public health offices.

Similar operational and managerial benefits were described in the other ministries we included in the case study data collection: Science, Immigration & Absorption, Finance, and Transportation. The Ministry of Immigration & Absorption obtained some additional returns from information integration linked to their responsibility for large numbers of immigrants—as many as 100,000 per year. The scope of social and economic services provided is large and the rules for eligibility for citizenship are complex. Information integration within the financial and procurement systems in Merkava, linked to the citizen data and business rules, provided the capability to identify improper or duplicate payments and manage payments to municipal agencies and other organizations operating immigrant programs. The Merkava HR system also provided the foundation for a business intelligence application to process rules for civil service pension eligibility. This application speeded and standardized the eligibility review for thousands of government employees.

External Returns

The Merkava and five-layer initiative were seen from the beginning as having returns well beyond the internal reform of government operations. One return that is emerging is a result of the impact the ERP and related systems are having on the relationships between the government and the private sector. For example, the financial sector and vendors doing business with the government are being influenced to implement their own reforms based on better information integration, Web enablement, and perhaps most significantly organizing around the kinds of standards in the Merkava ERP. Nir Gilad referred to this effect as the wave rippling outward from the impact of the Merkava ERP in the center of government. The potential returns to the public from this wave could well exceed those from the government improvements alone, though no measurements of these effects are available.

The political importance of the Merkava investment is also evident in the actions of the government and the public recognition of the program. The current Accountant General, Dr. Yaron Zalika, in charge of the Merkava and overall e-government initiatives, was named the current IT Official of the Year for Israel. The local press published regular articles (monthly or bi-monthly) about Merkava and related projects. Yitshak Cohen has been invited to speak about the project in several countries. Soon after coming to power in 2001, the Sharon government endorsed the Merkava project and later sponsored legislation to support and continue it. Prime Minister Sharon issued a strong endorsement of the continuation of these initiatives in 2003. The strategic plans and numerous press releases describe both the plans for development and the expected benefits for the quality of government and citizen life. These actions suggest the political importance of the ERP and related initiatives from the elected official perspective.

The interviews and documents reviewed for this case, consistently emphasized the importance of Merkava as a source of transparency and integrated, holistic views of government resources and operations. This transparency can produce public returns in several ways:

- Provides citizens with knowledge about how government works or information about access to benefits that they would otherwise be unaware of or not know how to acquire.
- Provides citizens with knowledge about government that helps them influence actions and decisions in desired ways.
- Access to the results of government actions and decisions provides citizens with material useful in evaluating government performance and engaging in political action and participation (advocating, debating, voting, etc.).
- Provides citizens with knowledge about government that increases their trust in and allegiance to the government.

- Availability for public scrutiny of information about government processes and decisions influences decision makers and other officials to pay closer attention to public interests and desires.

Overall, there is greatly increased quality and quantity of information about government performance becoming available from the ERP and related applications. This aspect of transparency increases the likelihood that assessment and ongoing performance improvement programs based on Merkava data will result in greater public returns from government services.

Implications for Public ROI Assessment

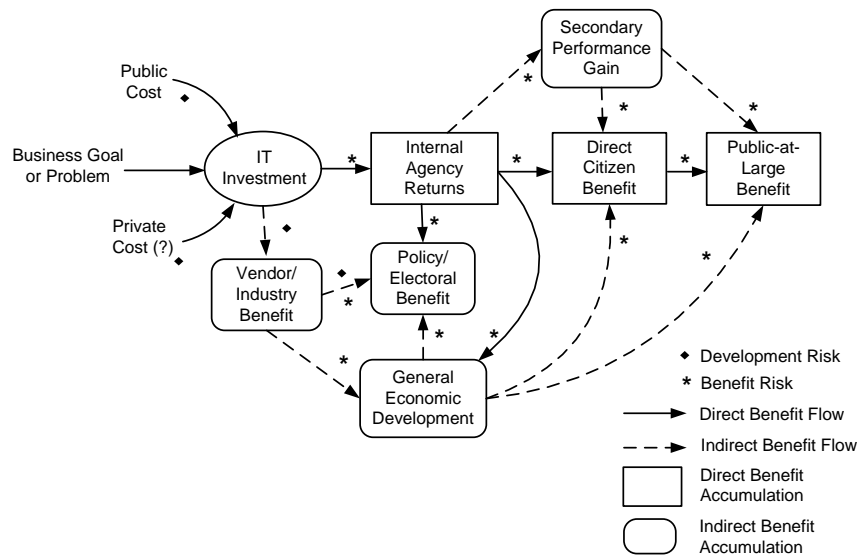
Based on the comprehensive nature of Merkava, the project's value proposition (Index:

Unshaded = Direct and documented returns

Hatched = Indirect or potential returns

Shaded = Not applicable or lack of foreseen indirect or potential returns at this time

Figure 3) appears to fit the overall proposition shown in Figure 1 above. There is ample evidence in the case materials for all of the returns accumulations in these figures, though the measurement and documentation has in most cases not been done. There is, however, a major issue with respect to the assessment of public returns for a project such as Merkava that deserves some added attention. This particular project was not originally conceived or implemented primarily to produce direct benefits to citizens. It is designed primarily to improve the internal operations and efficiencies of government and only secondarily to support or deliver direct benefits to individual citizens and organizations. The question arises, therefore, about how much beyond the boundaries of the project itself should an assessment reach for evidence of public returns attributable to Merkava.



Index:

Unshaded = Direct and documented returns

Hatched = Indirect or potential returns

Shaded = Not applicable or lack of foreseen indirect or potential returns at this time

Figure 3. Merkava Public Value Proposition

For this case, the answer to that question has been to include attention to returns resulting from some e-government program services that are not strictly speaking based in Merkava. This was done because the back office portion of the overall service process was either already part of the Merkava architecture

or planned to be. In a situation with a development approach like the five-layers model there are bound to be parallel lines of development that are part of the same vision but are technically separate. It seems that erring on the side of inclusion for such benefits is appropriate, with the necessary qualifiers, since to omit them would likely understate the overall value of any IT investment. More importantly, this broader view of returns fits with the vision of Merkava as the infrastructure for building improved services, both directly and through more general modernization and enhancement of management and controls. The challenge for assessing public returns is to trace the links between the infrastructure and all the returns it ultimately supports. For this case, much of the data for that analysis remains uncollected.

Another issue is related to the comprehensive, reform oriented nature of this project. Much of its public value rests on acknowledging and documenting returns that are difficult to measure: transparency, trust, and integrity of government; good stewardship of resources; public participation; and increased accountability. Considerable claims have been made by the designers and implementers of Merkava about returns of this sort. And the functionality of the systems themselves argue strongly for the existence of these returns. But there is at present little direct evidence to support the claims. Since many of the political returns have to do with public perceptions and attitudes, survey work with samples of citizens or more qualitative approaches like focus groups would be valuable. It would also be valuable to use the analytical capabilities of the ERP to track the shifts in expenditures and program activities to see if the expected increases in direct benefits in fact occur. The kind of data available from such inquiry would strengthen the case for continued investment and expansion of the overall initiative.