Enterprise Architecture Agility: Roadmapping with EARM

by Sebastian Konkol and Bartosz Kiepuszewski

In today’s turbulent economy, change is the only thing we can be sure about. It is primarily the ever-changing business and technical environment and increasing pressure to shorten the time of just about everything we do in business that has made the agile approaches to common management practices popular. However, in the field of enterprise architecture, agile methods and philosophy have yet to take off on a bigger scale, and as Jim Watson, Michael Rosen, and Kurt Guenther [6] rightly point out, common understanding between “traditional” enterprise architects and “agilists” is much needed.

Most of us have heard John Zachman’s often-quoted remark: “Someday you are going to wish you had all these models made explicit, enterprise-wide, horizontally and vertically integrated, at an excruciating level of detail.” Taking this remark too literally has caused too many EA teams to lock themselves in their ivory towers, snowed under by hundreds of models that no one is able to keep up to date.

One of the central themes of enterprise architecture (EA) is the need to build alignment between business and IT plans that reflect strategic corporate issues in the corporate information systems environment. Unfortunately, building actionable plans derived from company strategy takes some time, especially if joint actions of business and IT must be incorporated in the results. Worse still, introducing changes into such plans requires much time and effort to be spent again. In reality, since change is the norm in business today, these plans could become obsolete the moment the last change is incorporated and the plan is finally published.

We believe that there is an alternative to actionable plans — namely, a business-driven roadmap for extending the information system environment. The Enterprise Architecture Roadmapping Method (EARM)[1] is a method for time-efficient creation of a roadmap that presents EA evolution aligned with business goals derived from company strategy. EARM is a “fast-track” approach to working on IT strategy.

One of the basic reasons to propose a different approach to IT planning is the fact that change is inevitable. With this in mind, we make agility and adaptability the cornerstone features of IT architecture and organization.

A ROADMAP VERSUS A DETAILED PLAN

Strategic work on EA should not be confused with portfolio and project planning. IT strategy is an important input to the project portfolio (and ultimately budget) planning process, but it is not the only one. Any IT organization will have to run both strategically aligned projects as well as projects that respond to the current business units’ woes and pains. Confusing the two might push a strategic EA team into too low a level of detail.

When working on strategic directions for EA, it is important to keep in mind the overall picture; we don’t want the general idea of business and IT joint development to be lost due to an overwhelming level of details. Instead of using detailed plans, we at Infovide have adopted technology roadmapping processes.

Cutter Consortium Senior Consultant Borys Stokalski offers the following analogy to demonstrate the difference between a roadmap and a plan. Say you intend to drive between two cities. The route can be described in a series of detailed directions, such as “drive 10 km north, then turn left, drive 3 km northwest, turn right,” and so on. The same route could instead be described by specifying a series of checkpoints; for example, “starting from the town center, go to the crossroads close to the church, and then head toward the airport.” The first description is more detailed and precise, but if any problems should arise (e.g., car accident, traffic jam), you would be lost. Driving using the second description is more challenging, as it requires finding out how to get to the next milestone, but in the case of any unexpected events, you just need to get to the nearest checkpoint.

[1] See sidebar for an overview of EARM and [1] for a detailed description of the method and the rationale for its use.

EARM IN A NUTSHELL

As shown in Figure A, EARM consists of some generic steps that drive roadmap development. In the end, a target roadmap is created. Table 1 characterizes each step in terms of its goals, the tools and techniques used, and expected outcomes.

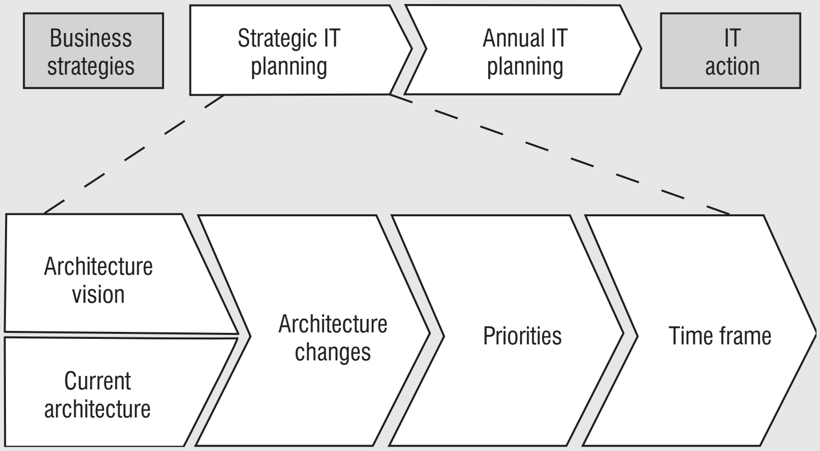

Figure A — The Enterprise Architecture Roadmapping Method (EARM).

Table 1 — EARM Steps

EARM Step	Goal	Tools and Techniques	Outcomes
Architecture vision	Create vision of the required architecture	• Business cycle classification • Architecture patterns • OODA cycle	Models of business and logical architecture depicting architecture vision
Current architecture	Understand current logical and technical architecture components	• Modeling of logical and technical architecture • Architecture patterns	Models of logical and technical architecture
Architecture changes	Determine the list of changes in the information environment	• Gap analysis matrix • Architecture variants	• Required list of changes • Applicable architecture patterns • Optimal technical architecture
Priorities	Align the list of required changes with business goals and intentions	• Weighted score matrix • SWOT analysis	• List of changes ordered according to strategic goals • Technical feasibility study
Time frame	Embrace roadmap enterprise architecture evolution	• Roadmap presentation • Architecture change description	• Complete and final roadmap • Description of detailed architecture changes

In the context of EA strategic planning, a roadmap is a visual representation of a transition from the as-is architecture to the envisioned to-be architecture. To be a useful tool for more tactical planning and budgeting processes, it shows important milestones along the route and the dependencies between them. Without getting into details, a good roadmap provides the information required for fast and efficient decision making, allowing you to assess your progress along the "driving" route and identify possible problems.

If you cannot draw a roadmap, perhaps you do not have a clear and understandable strategy at all.

A roadmap is the main product of an EARM process. It represents the aforementioned transition from an as-is architecture to the to-be architecture in terms of the "know why" (business goals and IT's role in achieving them), the "know what" (logical architecture), the "know how" (technical architecture), and the relationships among these elements. Rob Phaal, an internationally renowned expert on technology roadmapping, notes that being able to communicate your enterprise strategy with a roadmap is a "litmus test" of the maturity of your strategic planning process. If you cannot draw a roadmap, perhaps you do not have a clear and understandable strategy at all.

BUSINESS ARCHITECTURE

There is no doubt that the effective and efficient use of IT requires an understanding of the business being supported by it. Hence, any IT effort, strategic or not, should aim to clearly understand the underlying business woes and issues. The creation of a business architecture is a commonly agreed way of describing a business; however, what that actually means is far from clear. Traditionally, a business has been modeled as a collection of business processes, each of them being a sequence of steps performed by employees, partners, and/or automated systems with a clearly defined business goal. Even though such an approach appears to be very natural and well established, it has certain pitfalls that, in the context of IT strategic planning, should be avoided.

The first one is the danger of failing to see the level of detail that is necessary for EA efforts. For years IT professionals have observed business process analysis efforts performed during process improvement programs such as Six Sigma. Given the task of creating a business architecture as part of an EA effort, it is only natural for them to employ the same excruciating level of detail. Unfortunately, not only do they tend to lose the big picture this way, but the whole exercise also takes too much time (and money).

The second issue is the inherent inappropriateness of such models given the ever-changing nature of business. Processes, rules, and other detailed business descriptions evolve very fast, and architects who go into a deep level of detail may find themselves playing a never-ending cat and mouse game, always on the losing side. Consider that many business changes never get properly communicated to the architecture group unless such changes require modifications to IT systems. As a result of these "stealth" changes, architects tend to produce a lot of models and documents that quickly become shelfware.

In our practice, instead of going deep into business process modeling, we use a different technique for developing business architecture. Typically we start with a generic business model based on a set of end-to-end processes, which we prefer to call business cycles,[2] thus emphasizing that an end-to-end business process should form a "closed loop" and be able to respond and readjust according to the data gathered during its previous runs. The core idea of a business cycle is that it represents some operational, tactical, or strategic ability such as order fulfillment (demand-to-service cycle), payment collection (order-to-cash cycle), or new product development (stimulus-to-strategy cycle). The big picture of a business architecture is that for any enterprise, it is more important to have a given business capability than to have specific business processes describing in detail how this capability is being achieved. And to be truly competitive, any company should push its business cycles to the limits and run them faster than its competitors do.

The notion of business cycle analysis has been incorporated into EARM for the purpose of business architecture modeling. (Note: This analysis is based on the Observe-Orient-Decide-Act [OODA] model, which we explain further below.) Thinking about a particular cycle, the EA team can quickly determine what should be changed in the EA to achieve a certain business

[2] An example of adaptable business cycles in use can be found in [3].

capability. An example of such an analysis is shown in Figure 1.

ENTERPRISE ARCHITECTURE CAPABILITIES

The analysis of the enterprise business cycles is an important step in EA efforts. However, to find gaps and future directions for an enterprise IT architecture, we introduce another concept, which we call enterprise architecture capabilities. We use them instead of specific information systems functions to point out the relationship of IT logical architecture to business architecture, described as a set of business cycles and business capabilities. Again, this follows the observation that the level of detail of system functions is too great; they change and come and go too often.

In order to determine the EA capabilities required to support a certain business cycle, we decompose it using the OODA model. OODA is a powerful concept that allows us to apply some "lateral thinking" to any business cycle. That is, it forces us to ask some nonobvious questions, such as "What tools do we use to 'observe' events in a particular business cycle?" or "Should we act on the data gathered during the observe/orient phase of the cycle?" OODA was first described and successfully used by US Air Force Colonel John Boyd, who used it to present concepts of maneuver warfare (see [2]). He observed that to be successful in air combat, it is not enough to optimize jet aircraft for speed or maneuverability alone. What makes a particular pilot successful is his ability to run the full OODA cycle faster than his opponent can.

We use OODA to select the enterprise IT architecture capabilities that are responsible for supporting each of the four stages of a particular business cycle. By mapping each of the four OODA phases onto the EA, we can find out whether the business cycle is fully supported (e.g., "Are there any EA capabilities that support the 'observe' phase of a given cycle?") and/or what can be done to run the cycle faster. Since, according to the OODA model, success hinges on performing the relevant business cycles faster than one's competitors, supporting and shortening these cycles through enterprise IT architecture capabilities directly enables a company's strategy.

		Business Cycle: Demand to Service (Operational Cycle)				
		Capability Description	Timing	Time-Based Issues	Systems	Remarks
OODA	Observe	Catch event describing service order arrival	Online	Order Management takes care not to put delay in service delivery process	Order Management, Configurator	Online integration between Order Management and Configurator needed
	Orient	Preparation of network configuration and checking for resource availability	Online	No delays between Network Inventory, Configurator, Automatic Request Processing	Configurator, Network Inventory	Online integration between Configurator and Network Inventory needed
	Decide	Configurator decides on configuration implementation based on available resources	Online		Configurator	
	Act	Decision is passed to Activator taking care of service delivery	Online	No delays in communication between Configurator and Activator	Configurator, Activator	Online integration between Configurator and Activator needed

Figure 1 — OODA decomposition of the demand-to-service business cycle.

FOCUS ON STRATEGY

In many enterprises, the creation of short- and medium-term plans follows a predefined sequence of activities and deliverables. After senior management specifies strategic goals, a business strategy is derived. Subsequently, this business strategy is communicated to IT, which does its best to support these plans. In every step of such a process, miscommunication occurs, some strategic intentions get lost, and the relation of IT plans to business strategy weakens to the point that in the end it may not exist at all.

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Working on things that are not well aligned with the company strategy is a waste of money and time. The problem with IT spending arises, generally speaking, from two main issues:

1. Absence of IT input in all phases of strategic planning
2. Inability to assess the level of current IT support of the company strategy

As Cutter Consortium Senior Consultants Bob Benson, Tom Bugnitz, and Bill Walton have observed, IT should be explicitly represented in every stage of strategic planning [1]. Its role in strategy formulation could be expressed as a set of “strategic intentions for use of IT” — high-level statements in business terminology of how IT can support business intentions and imperatives. These intentions should be strongly connected with strategic goals to be achieved by the whole company. They are measurable in terms of support for the company strategy and — more importantly — they can be rank-ordered according to how well they are aligned with the business strategy. Thanks to the rank-ordering, it is quite easy to identify the endeavors that support the company strategy the most and thus allocate effort to these projects.

The roadmapping used in EARM explicitly requires the roadmap creator to clearly understand the rationale for each roadmap milestone (the “know why” perspective). We applied the concept of rank-ordering in EARM to assess the importance of various architecture changes with respect to the business goals. The crucial feature here is that the assessment is being performed with a direct focus on strategy — using business goals (in EARM) or strategic intentions for use of IT (as presented in [1]).

AGILE APPROACH

The common approach to technology management is to hide it from business. Describing technology complexity to businesspeople who are not educated in that area is a challenge, and it is quite tempting not to do it. But surrendering to this temptation makes direct communication between business and IT all but impossible. The consequences are quite obvious — there is no common understanding (either of business problems by the IT organization or of IT complexity by the business staff), and long periods of time elapse between plan updates. If this gap is not bridged, we cannot expect IT to be well aligned and properly understood by business.

The necessity for efficient communication between business and IT has been stressed many times in the literature. We strongly believe that applying agility concepts to management discipline is a vital and valuable endeavor. While “agility” is a broader concept, we focus on the communication and adaptability aspects as the most readily applicable to joint business and IT planning. The basis for such planning is an “agile management loop” as described by Cutter Business Technology Council Fellow Jim Highsmith [4] — a direct and short communication path between business and IT with fast and frequently received feedback.

To communicate properly, business and IT must use terms that both parties understand. “Strategic intentions for the use of IT” is one of them — business cycles, OODA, and enterprise architecture capabilities may be others. In the final analysis, the roadmap — which is the end result of the EARM process — is nothing more than a powerful, visual communication tool. As Highsmith rightly points out, it is not that difficult to list all the desired features of a product in development. What is difficult is to agree on the three that are most important. The same goes for a roadmap. It, too, is a technique based on the principle of limited space, so what is shown there must represent the crucial “nuts and bolts” of the strategy. Getting both business and IT to agree on the core items and milestones of a roadmap requires intense collaborative work on the part of both “camps.”

CONCLUSION

Without risking much exaggeration, one could state that "enabling agility" is the major direction in the evolution of modern management practices. Along with that, more and more agility is required in IT management. Enterprise architecture initiatives must be therefore implemented in a way that delivers the expected value without any unnecessary overhead, time lags, or bureaucratic obstacles. EARM is a practice-based example of such an approach that has been tested in a number of real-world situations.

EARM focuses primarily on ease of communication, adaptability, and establishing a clear relationship between technology and business goals. The EARM approach — joint business and IT development planning using roadmapping concepts — makes a company's use of IT more adaptable and thus gives more value to the company.

As EA decision making is no longer the exclusive province of the CIO organization and increasingly becomes a joint decision-making process between business and IT, awareness of architecture issues must be achieved through efficient communication among all decision makers. EARM allows business and IT managers to make informed decisions regarding short- and medium-term plans for EA evolution in pursuit of company goals, while providing a solid foundation for strategic decisions.

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