MANAGEMENT OF LEGACY MIGRATIONS - DEALING WITH THE UNKNOWN

Exploring the Unexplored

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CONTENTS

ABSTRACT

This whitepaper tries to present a holistic view of the legacy migration philosophy right from the project inception at the sponsors and customer level down to the engineering team, to interest the audience of this whole spectrum. The thoughts shared here apply equally to software application and hardware/system migrations. Based on my hands-on experience with assessment of need for both software and hardware migrations, I have tried to elicit the salient points w.r.t. risks, questions and confusions on various fronts. This paper does not intend to be a text bookish solution to the highlighted challenges but only to lay down a general guided approach. Specific solutions are best left to every organization's own current cultural (people) & process capability and future roadmap.

For illustrative purposes of software migration, VB6 as the legacy system and .Net as the target platform are sometimes assumed for this paper. For hardware or system migrations, need for energy efficiency improvement has been assumed as the prime motivation.

INTRODUCTION

Organizations of today are replete with legacy systems and software frameworks and applications which have been responsible for making these companies stand tall among their competitors in terms of the technical edge and revenues over the years. Dynamic business scenarios like increasing customer base, more competitive response time and precision requirements etc. and the technical challenges associated with these are generally the triggers for migration of software applications or databases in enterprises.

On the systems side, some of the components involved, like motors, drives etc. have evolved significantly over time to become highly energy efficient. As a solution offering which combines these various components, there are humongous benefits that await any industry like cement, F&B, pulp and paper etc.

Decision to migrate should be taken early enough to retain its business value but with thorough investigations and preparation in terms of tools, skilled people etc. If legitimate migration needs are not addressed in time, organizations run a high risk of the following:

1. **Losing the existing customer base** to competitors with similar products on newer technologies
2. Could lead to **drastic failures in mission critical environments**.
3. Not getting the required support for the legacy platforms from the OEMs could once again lead to failure of critical systems

Before we move on further, please take note of the following table (Table 1) as a reference to the defined business factors around which the discussions in this paper are centred.

Business Factors	
ID	**Description**
BF1	Cost
BF2	Performance
BF3	Capability
BF4	Supportability
BF5	Effort

Table 1 – Business Factors

DETAILS OF THE PAPER

Migration from legacy is a need that is understood by all but unfortunately it stops short of realization in many cases due to the following main challenges:

1. Accuracy of estimations of migration efforts is one of the biggest challenges especially if there is no past experience with the same source and target software platforms / systems. [This could lead to low confidence ROI calculations.] [Ref. Table 2: Cat. ID # 3]

2. Finding the right people to work on a migration is another big challenge. The legacy software skills and legacy systems knowledge can be rare. The few people available to do this could be fairly senior people coming at a high cost. [Timelines to find and staff such people are uncertain and their costs impact the ROI again] [Ref. Table 2: Cat. ID #5]

3. Delivery maturity and the level of process knowledge of the organization in adjudging the business value and ROI with a high accuracy. This is tricky due to migration estimation challenges. Depends on how mature is the organization on the migrations front already or able to leverage the experience elsewhere in the industry. A seamless transfer from old system to the new one is a basic customer demand which requires process experts and prior migration experience. [This could lead to low confidence ROI calculations] [Ref. Table 2: Rec. ID # 3.4, 3.2]

4. If the organization's legacy system to be migrated depends on other 3rd party systems which are also legacy and not supported by their OEMs, then a migration path for the 3rd party system cannot be guaranteed which could fail the migration case for the primary system also. This could call for huge software rewrite / system re-engineering efforts. [This could lead to low confidence ROI calculations] [Ref. Table 2: Rec. ID # 1.1, 3.5]

5. In case of software, dilemma of whether to invest in developing own customized tools for aiding migration or to purchase 3rd party tools off the shelf. [This could impact ROI decisions] [Ref. Table 2: Rec. ID # 1.1, 1.2, 3.1, 3.2]

6. Mindset challenges – The users of the system could be so used to the older legacy platform and not ready to adapt to the newer system. [Acceptability of the new system is elusive] [Ref. Table 2: Rec. ID # 1.1, 2.1, 2.4, 3.5, 3.6]

To sum up, following are the questions in the minds of the various key stakeholders:

End customer's management team:

1. Will there be risks associated with continued usage of a product on legacy platforms (especially if applications are mission critical)? [Ref. Table 2: Rec. ID # 1.1, 2.1, 3.6]
2. Is there a real technology advantage in skipping the existing vendor and going in for a competitor with more modern technologies? [Ref. Table 2: Rec. ID # 1.1, 2.1, 3.6]
3. New technologies keep coming into the market so very often – does it really make sense to keep upgrading? [Ref. Table 2: Rec. ID # 1.1, 2.1, 3.6]
4. Retrofit mechanisms like data adapters (ODBC), interops etc. in case of software, seem to work just as well, then why go in for a complete migration path? [Ref. Table 2: Rec. ID # 1.1, 1.2, 2.1, 3.6]
5. What will be the ROI profile of this investment (payback, IRR, NPV etc.)? [Ref. Table 2: Rec. ID # 1.1, 2.1, Cat. ID # 3]

Vendor's Management team:

1. The customers might get a similar product by a certain date from a competitor. Will we be able to position our existing legacy product with similar functionalities on a newer technology by then? [Ref. Table 2: Cat. ID # 3]
2. What will be a realistic timeline to commit for the migrated product? [Ref. Table 2: Cat. ID # 3, 4, 5]

Vendor's Development/Engineering team:

Management is asking for a timeline. How do we commit something when we ourselves don't know what could be the complex or unforeseen scenarios? [Ref. Table 2: Cat. ID # 1, 3, 4, 5]

Proposed Approach

I will like to refrain from giving a "text bookish" technical approach to migration in this paper. What is more important is to establish an ecosystem first, in terms of processes, best practices, tools and people for effectively evaluating and executing such migrations.

Some of the recommendations for doing this are shared below (based on experience of handling such projects and also from other projects in the industry**):**

Table 2 – Recommendations (Best Practices and Lessons Learnt)

Cat. ID (Category ID)	Category	Rec. ID (Recommendation ID)	Recommendations (Best Practices and Lessons Learnt)
1	Analyzing and building a migration business case *(Impacts BF1, BF2)*	1.1	Engage the development/engineering team very early in the lifecycle with the users of the legacy application so that they can jointly analyze the real technical need and feasibility of the migrations. If possible, co-locate the teams and/or shift the working times to maximize the overlap with end users work timings.
		1.2	Be ready for a range of proof of concepts and experiments to make the migration business case stronger. This is usually a part of the application assessment phase. Have numerous credible case studies from industry in place for reference.
		1.3	Do not allow system implementation to begin until a migration plan is approved and the "buy-in" of the affected stakeholders is obtained.
2	Migration effectiveness *(Impacts BF1, BF2, BF3, BF4, BF5)*	2.1	Analyze the needs of the affected stakeholders to determine migration schedules, training requirements, and operational shift to the new system.
		2.2	Develop quantifiable measures of success for the migration effort.
		2.3	Establish criteria to evaluate the level of difficulty of transitioning the user community corresponding to each legacy system.
		2.4	Arrange for regular and frequent feedback sessions from the end users. This will help keep the migration efforts on the right track and delivering the desired functionality. If possible, co-locate the teams and/or shift the working times to maximize the overlap with end users work timings.
		2.5	Ensure that the scope of migration planning includes deployment, transition to full operational use, and phase out of any affected legacy systems.
		2.6	Establish a goal-driven measurement program based on stakeholder needs to obtain visibility into the migration effort.
3	Migration effort estimations, costing and business value *(Impacts BF1, BF5)*	3.1	Use automated tools (either develop your own or third party).
		3.2	Lay foundation of migration estimation baselines early in the organization and keep refining them based on new migration experiences. Focus on tying this tightly to the historical database in the organization.
		3.3	Be prepared for multiple revisions in delivery schedule. Estimation of a migration project is very different from estimating a regular development project. Migration projects can undergo multiple schedule revisions due to complex and unforeseen migration needs and other dependency situations.
		3.4	Make provisions for maintaining a database per legacy technology migration to a particular target, on what is portable and what is not (migration cannot be automated and requires a rewrite).
		3.5	Establish a very early tight integration between the vendor technical team (product managers, technical leads etc.) and the end customer's technology team to help them get a realistic feel of the technical risks in keeping with legacy or merits of migrating. If possible, co-locate the teams and/or shift the working times to maximize the overlap with end users work timings.
		3.6	Initiate the migration planning effort at the outset of the project before the development and implementation approach is set in concrete.
		3.7	Have models drafted with NBFCs (Non-Banking Financial cos.) for tripartite agreements with customers (to address the customer risk of delayed paybacks)

4	**Migration scheduling** *(Impacts BF1, BF2, BF4, BF5)*	**4.1**	Plan well in advance to make available, the legacy software platforms at the development end for development and functional testing aspects. Have a list of vendors ready that sell second hand legacy hardware.
		4.2	Avoid a "big-bang" approach to migration. Break the problem into "doable chunks" that correspond to the planned rollout of new system solutions.
		4.3	Give consideration to any organizational infrastructure improvements that can accelerate the migration effort or may be needed to overcome impediments in the current working environment.
		4.4	Consider addressing high-risk migration issues first since their solution may have the greatest impact on the development effort and may determine the feasibility of migrating users of every legacy system.
5	**Skilled resources availability** *(Impacts BF1, BF2, BF3, BF4, BF5)*	**5.1**	Keep a task force (knowledgeable in the legacy technology) identified and available among the younger, more cost effective workforce.
		5.2	Account for enough time for their ramp up on both the legacy source and the new target technology.
		5.3	Identify and engage the required domain resources early into the migration cycle

CONCLUSION

Successful undertaking of legacy transformations is a delicate and complex interplay of many factors that affect all stakeholders at every level of the value chain starting from the customer to the vendor company delivering the new solution. The key factors to be managed at the customers' end are senior management expectations w.r.t. ROI, payback and technology benefits selling. The salient factors to be managed at the vendor side are ensuring availability of the right resources, having an ecosystem to maintain historical records for accurate estimations and schedule projections. More than any other project, legacy transformations need tighter and a much early-on integration between customer and vendor teams.

REFERENCES

None.