Next Wave of Servicing Enterprise IT Needs

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Abstract—Enterprises use IT systems to derive mechanical advantage through automation of business process steps. Prevalent labor arbitrage outsourcing model has delivered significant savings in run-the-business IT costs. For a variety of reasons, change-the-business IT costs continue to be significantly high. With continually increasing business dynamics and increasing dependence on IT systems, the problem of managing these costs with certainty is getting ever more difficult. We propose a model-driven approach for addressing this problem. The paper discusses current practice to motivate the problem, describes a model-driven architecture to address the problem, and discusses various research, engineering and business challenges for its realization.

Keywords—enterprise modeling; enterprise architecture; IT plant; model driven engineering

I. INTRODUCTION

A large portion of enterprise’s operational processes are today automated through the use of IT systems. The as-is state of the enterprise is largely the result of a sequence of automation decisions each taken in specific contexts. These specific contexts come into existence due to siloized nature of businesses [1], which leads to several problems with the enterprise’s IT systems such as: i) either partial or complete overlap of business functionality, ii) sub-optimal design of operational processes, iii) sub-optimal implementation of operational processes, iv) plethora of non-interoperable technology platforms, and so on [2]. Given the tight economic environment, enterprises can stay viable only if the IT costs are reduced by a factor. This calls for a whole new approach to service the IT needs of enterprises.

The present headcount based labor arbitrage model through which enterprises engage with IT service providers (SPs) either for managing bottom-line or adding to the top-line seems to have ceased to provide the desired value [3]. We believe that enterprises would want to increasingly focus on their core competencies and look for an IT SP who can be the single source catering to all transactional and transformational IT needs. Enterprises will soon start demanding outcome-based pricing thus making IT SPs share some of the operational risks [4]. Minimally, this necessitates that IT SPs shift from labor-based to asset-based service delivery. Thus, it is becoming imperative that IT SPs invest, safeguard and nurture business assets in a manner that IT needs of a set of enterprises can be met from a set of assets with common functionalities and configuration support for variable functionalities.

Owing to our expertise in model-driven engineering and delivery of large enterprise applications [5]-[8] in cost effective manner [9], in some cases using product line concept [10], we propose a model-driven take on conceptualizing and realizing a new outsourcing model that enables servicing of transactional and transformational needs of enterprise IT systems with outcome-based pricing and on operational risk sharing basis.

We define an IT plant for the enterprise to be a set of interacting IT systems, the technology infrastructure they use, and the hardware infrastructure used for execution. Our key contributions with regards to servicing IT plants of enterprises are twofold- one, we propose a new model of IT plant product-line and show that this innovative model can prove beneficial in catering to needs of enterprises creating a win-win situation for both SPs and enterprises, and second, we provide two kinds of support to realize IT plants namely, analysis and operationalization. While the analysis support focuses on providing demonstrable evidence of functional and non-functional characteristics of proposed IT plant, with operationalization support we plan to use the insights obtained from analysis in the actual implementation of the IT plant.

The rest of the paper is organized as follows. Section II presents motivation to solve value-based outsourcing problem using an illustrative example and outlines the product line aspect of the proposed solution. Section III describes how value benefits apart from cost benefits may be obtained using analysis and operational world views of IT plants. In Section IV, we put forth several work-packages that can realize IT plant product line for enterprises in the same vertical and prove beneficial to both enterprises and SPs. Section V describes some early results that we have obtained with some of the work-packages. Section VI briefly reviews key related work and Section VII concludes the paper.

II. MOTIVATION

Enterprises use IT systems to derive mechanical advantage through automation of operational processes catering to their strategic, tactical and operational needs [11]. These needs could either be transactional or transformational thus leading to run-the-business (RTB) and change-the-business (CTB) costs respectively. People and various aspects of an IT plant namely, interacting IT systems, and technology and hardware infrastructures can be considered to be the principal levers for managing IT costs to business. Until now, focusing on people aspect, labor arbitrage outsourcing model has brought down costs significantly by transferring development and maintenance of IT systems to low cost geographies i.e. replace enterprise’s
people with SP’s. In addition, consolidation and rationalization of hardware infrastructure and harmonization of technology infrastructure have brought down the costs even further. But outsourcing and hardware consolidation are fast approaching the point of diminishing returns and harmonization of software infrastructure can bring in only so much benefit [12].

Large enterprises have traditionally been operating in a siloized manner for ease of management and control. As a result, IT needs of an enterprise become apparent in parts with a dedicated IT application getting implemented to cater to each in part need. Patches introduced for local optimality result in globally sub-optimal design and implementation of business processes that typically spread across many departments. Moreover, current practice of siloized operation makes it very hard for the complete enterprise-wide picture to emerge, depicting its IT systems and how they interact with each other. IT departments only know their local context. Due to this, IT systems are developed independently and individually to service globally felt need in a very specific context resulting in a plethora of IT systems servicing same global need. Furthermore, technological needs in specific context may vary, resulting in widely non interoperable technologies, requiring technology adapters and resulting in writing and reading from specific data sources because message passing between technologies is no longer possible. Widespread redundancy of IT systems with non interoperable technologies is arguably the single largest cause for highly escalated cost of IT to business.

Faced with the consequences of diminishing returns, an enterprise, in absence of the complete picture, has no option but to live with the as-is state that is destined to get increasingly sub-optimal over time as local fixes keep on getting introduced. Increased business dynamics, highly connected nature of IT systems, rapid rate of technology advance / obsolescence, heterogeneity and wide variety of technology platforms used by an enterprise, and sheer number of business applications all further contribute to making the management of CTB costs an involved and almost an intractable problem. Clearly a new approach for managing CTB costs with certainty is needed.

In the absence of complete information regarding the as-is state of enterprise’s IT systems, the transformational decisions are typically taken putting faith in the ability of gurus to predict which of the many possible states will be the most beneficial. Latency of validating such predictions is typically in terms of months if not years and comes with high system development costs that may have to be completely written off.

As an illustrative example, consider two financial services enterprises. The first is a large public sector bank that offers wealth management products for select individuals who are mostly its customers for some other service. Apart from portfolio management for wealthy individuals, the bank also focuses on leveraging government policy changes with regards to home loans. For instance, to encourage first-time home buyers, the Indian Union Budget has proposed an additional 0.1 million Indian Rupees interest deduction from their gross total income on loans up to 2.5 million Rs. The bank in the example wants to leverage the opportunity and introduces a specialized product targeted first-time home buyers who are more likely to be young salaried individuals. Both the products target different segments of customers which can be chosen based on spend and market trend analyses respectively. A classification of this bank’s products and processes is shown in Table I.

Customers are acquired for wealth management products if they are already availing other services offered by the bank and other factors including spending habits and market trends. Back office processes for unique selling proposition (USP) products include product-specific reviews, continuous monitoring of customers’ wealth for better deployment into various investment instruments and so on. Back office processes for commoditized services includes generating alerts with regards to maturity dates, loan repayment dates, insurance premium due dates and so on.

The second enterprise specializes in personal financing. Its USP is quickly (within minutes) granted personal loans for consumer appliances such as mobiles, laptops, washing machines, TVs, refrigerators; lifestyle products such as refurbishing of homes, ordinary to modular kitchens and so on. Customers are acquired for these products by arranging for in-store executives at select partner stores, malls, where an individual decides to buy an appliance and decides to avail quick 0% interest loan for the same. Back office processes for these products include generating monthly reports for USP products and for commodity services generate reports mainly

### TABLE I: Products and Processes of a Public Sector Bank

<table>
<thead>
<tr>
<th>Unique Selling Proposition</th>
<th>Commodities</th>
</tr>
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<tbody>
<tr>
<td><strong>Customer facing</strong></td>
<td></td>
</tr>
<tr>
<td>Specialized Portfolio (wealth) product via private banking for high net worth individuals, Loan products to leverage government policy changes</td>
<td>Offer some existing customers to migrate, open wealth management/specialized loan account, provide CRM facilities</td>
</tr>
<tr>
<td><strong>Back office</strong></td>
<td></td>
</tr>
<tr>
<td>Periodic Reviews, Continuous monitoring and analysis to ensure customer’s wealth is deployed optimally, comprehensive investment statements, alerts on maturity dates, best-in-class banking and investment products recommendation</td>
<td>Alerts on maturity dates, loan repayment dates, insurance premium due dates and so on</td>
</tr>
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### TABLE II: Products and Processes of a Lending Firm

<table>
<thead>
<tr>
<th>Unique Selling Proposition</th>
<th>Commodities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer facing</strong></td>
<td></td>
</tr>
<tr>
<td>Quick/Flexi loan products for consumer appliances esp. electronic products like mobiles, laptops, TV, etc., lifestyle finance products for 0% loans on home improvement, modular kitchens, etc.</td>
<td>Interaction with in-store executive at partner stores, 5 minute personal loan account opening</td>
</tr>
<tr>
<td><strong>Back office</strong></td>
<td></td>
</tr>
<tr>
<td>Monthly reports to customers for completed Equated Monthly Installments and remaining sum</td>
<td>Reports for auditory purposes</td>
</tr>
</tbody>
</table>
TABLE III: IT Needs of Financial Services Enterprises

<table>
<thead>
<tr>
<th>Customer facing</th>
<th>Commodity</th>
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<tbody>
<tr>
<td>Customer profile-specific products</td>
<td>Processing required for product-specific customer acquisition, account opening, CRM facilities</td>
</tr>
<tr>
<td>Back office</td>
<td>Product-specific reports and services</td>
</tr>
<tr>
<td></td>
<td>Performing and non performing assets reports, reports for auditory purposes</td>
</tr>
</tbody>
</table>

for audit purposes. This is shown in Table II.

It can be seen that USP and commoditized products and services and their customer facing and back office realizations can be captured in a generalized form as shown in Table III. Customer acquisition is product and customer profile-specific but it is essentially same at the strategic level. The same can be said about product-specific account opening and maintaining processes, customer relationship and helpdesk services. At the back office, product-specific report generation and processes for value added services may take place, whereas for commodity processes these could take form of audit report generation.

Any enterprise has three types of goals, namely strategic, tactical, and operational [1]. Strategic goals focus on the long-term orientation of the organization such as profitability and agility. Tactical goals focus on the how to of a strategic orientation. These are set around primary strategic plan of the organization. Tactical planning is short-range planning that emphasizes the current operations of various parts of the organizations possibly that of several individual business units of the enterprise. Operational goals focus on facilitating and in many cases implementing tactical goals at the ground level. We have observed that IT needs of enterprises as shown in Table III may originate from any of strategic, tactical, or operational goals of an enterprise and furthermore, from strategic to operational goals and their implementation, minor to major variations get introduced which reflect into the IT needs of concerned business units.

We also have observed in our interactions with enterprises from banking, finances, insurance domains that a more generalized version of customer facing and back office processes for USP and commodity products and services can always be arrived at and that commonalities and variations become apparent when this is done. For instance, IT needs of back office and commoditized processes are more or less the same, where as IT systems for back office and USP and customer facing and commodity processes display many common characteristics with variations introduced by USP product-specific realizations. When serving the IT needs of these processes, a related set of IT specifications can be imagined. This is a specification that encompasses possible variations and all commonalities from which the desired IT specification with all commonalities and specific variations can be automatically derived under human guidance.

This is indicated in Figure 1 using product line concept [10] applied to IT plants for enterprises in same vertical, with our illustrative example this is personal finance services. We have observed that the cells containing categories specified above and shown in colored background in Table III indicates where enterprise have IT needs that can be outsourced and also IT needs of enterprises that service providers can service much more effectively than using the prevalent outsourcing model.

The key elements of the enterprise IT outsourcing business model and its realization as illustrated in Figure 1 are as follows:

1) It should be possible for an SP to cater to IT needs of multiple enterprises through a single multi-tenant IT plant. It essentially means that an SP can use IT plant specification and implementation in product-line like manner for catering to needs of enterprise in the same vertical. IT plant of an individual enterprise should be easily configurable to meet a priori known specificities of an enterprise.
2) It should be possible for an enterprise to get a feel for the IT plant being offered by an SP both in terms of functional and non-functional characteristics. It should be possible for SP to know the IT needs of enterprise so that they can be demonstrably met by the IT plant being offered.

In the following section we outline our proposed approach.

III. OUTLINE OF THE PROPOSED APPROACH

The proposed approach takes into cognizance commonality of IT needs within and across enterprises in a business domain so as to be able to cater to IT needs of the entire business domain through a single configurable and extensible domain specific IT plant. It relies on analysis and simulation of machine-manipulable enterprise models so as to be able to minimize transformational uncertainty to the extent possible. It uses planning techniques to derive transformation plan from the as-is state of enterprise to the to-be state and enables implementation of the transformation plan through configuration and extension of the domain-specific IT Plant thus providing a complete end-to-end solution to the problem.
We look at supporting enterprise IT outsourcing in terms of two related worlds namely, analysis and operational. We propose further that both these worlds be model-driven.

**Analysis** world would represent an enterprise in terms of its goals, operational processes, organizational structure etc. These models are closer to the business domain and yet machine-manipulable so as to be able to establish a specific property and/or explore answers pertaining to questions regarding efficacy of the as-is state, a set of possible states, most desirable among the possible states vis-à-vis a given criterion etc.

Though models pertaining to this world might be created from a restricted perspective of IT systems automating the enterprise, they do not model the IT systems per se. Analysis world enables (data-driven) decision making thus reducing dependence on experts’ intuition and/or expertise. Analysis world is essentially supposed to come up with interesting possibilities for improving the as-is state of enterprise and also outline a path from as-is state to the desired to-be state. Enterprises operate in a dynamic environment and hence need to change continuously along with its IT plant. Response to a change needs to be fast and accurate. To check what happens when a specific response is chosen, models for supporting what-if and if-what scenario playing would be required. These models need to be domain-specific; in fact, there is a need to model the domain itself to enable its automated analysis.

**Operational** world of enterprise IT systems would represent an enterprise in terms of models its business processes, applications used for automating the business process tasks, agents performing the assigned tasks, Technology and IT infrastructure needed for execution etc. In short, a model of the complete IT plant that automates a set of operational processes through a set of software systems ensuring correct operation of the enterprise both in functional and non-functional sense.

Since the aim is to cater to the IT needs of multiple enterprises in a given vertical and IT needs of no two enterprises are likely to be exactly the same, purpose-specific IT plant seems required. However, this doesn’t lead to a viable business model. It is imperative that the IT plant actually is a product line of a set of related IT plants such that a purpose-specific IT plant can be easily derived. Ideally, the derivation process should be as simple as selecting one from the set of many a priori known well-formed and internally consistent configurations. Also, the derivation process should be user-controlled and be effectible at run-time for greater agility. In fact, every element that IT plant comprises of must also be configurable.

The key challenge pertaining to operational world is that the IT plant should deliver the desired functional and non-functional requirements and be realizable in terms of multiple technology platforms. The specification of the IT plant should be closer-to-problem-domain, intuitive and technology agnostic so that domain experts will find the notation easy to use. The specification should be complete in terms of its ability to address stakeholder needs on the user side of IT plant. Minimally, it is felt, the specification should cater to functionality, business processes, data and user experience aspects of IT plant and their inter-relationships.

Without a traceable link, possibly bi-directional, between analysis and operational worlds it would be impossible to utilize insights obtained in the analysis world in the operational world. Given the widely different nature of models (and meta models) belonging to analysis and operational worlds, this could be a hard problem. The next section elaborates the research challenges involved in realizing in concert the analysis and operational worlds of IT plant product line for enterprise IT systems. Also, solutions to these research challenges can come together in multiple ways each possibly enabling a different opportunity for creating significant business impact. This entire line of thought is represented in Figure 2.

IV. **Work-packages for Enterprise IT Plants**

Using Figure 2, we present what needs to be done in order to achieve analysis and operationalization of IT plants that address enterprise IT needs in terms of several work-packages as below:

**Enterprise specification** This work-package constitutes coming up with languages (and notations) to model the set of relevant concerns of an enterprise such as intent or goals, operational processes, organizational structure, services, etc. These are models of enterprise based on enterprise architecture (EA). This is indicated by ① in Figure 2. An EA is defined as the process of translating business vision and strategy into effective enterprise change1; or the organizing logic for business process and IT infrastructure that can be targeted at a company’s operating model to address its standardization and integration requirements2.

The EA models should be machine-manipulable so as to support automated what-if, if-what analyses [13], change impact analyses [14], [15] among others. It will also be possible to establish functional and non-functional properties of an enterprise in qualitative and/or quantitative terms [16]. We will also investigate possibility of arriving at a transformation plan from as-is state of enterprise to the desired to-be state [13].

**Enterprise simulation** At present, techniques and technology exist to simulate an EA model/ or a specific set of concerns individually and independently [17]. However, simulating an enterprise would need simulation of all its models in concert which is not possible today as shown by ② in Figure 2. System dynamical models are characterized by a small set of primitives and powerful simulation machinery [18]. This work-package constitutes evaluation of system dynamical models for enterprise modeling, developing simulation machinery for EA models that can be specified as above, and investigating if a link can be established between EA models and system dynamical models. Objective here is to advance state of art in simulation and applications/applicability of simulation techniques.

**IT plant specification** This work-package constitutes specifying various concerns of IT plant so as to generate a configurable extensible platform implementation using it and to help monitor, evolve and adapt IT plant under human supervision as indicated by ③ in Figure 2. At present it is possible to specify the various concerns of a business application e.g. user interface, data and data access, online and batch functionality,

1http://www.gartner.com/it-glossary/enterprise-architecture-ea/ Gartner IT Glossary
2http://cisr.mit.edu/research/research-overview/classic-topics/ enterprise-architecture/ MIT Center for Information Systems Research
Fig. 2: Schematic Overview of the Proposed Solution

reports etc., in a model form from where an efficient implementation can be effectively and efficiently generated. It is also possible to specify interactions between applications as an orchestration or choreography. Early advance has taken place as regards design-time and run-time configuration of an application. However, little work is reported on application architecture to support a priori unknowable extensibility. Business Process Platforms (BPP) providing a set of business processes and their automation through a set of services out of the box was a buzzword around 2005 which has remained unrealized [19]. Early advance in adaptation architectures is limited to individual applications [20]. The adaptation concept needs to be extended to other constituents of IT plant such as business processes, batch programs etc. individually and to the whole IT plant collectively. Objectives of this work-package are to come up with i) an implementation architecture for BPP with additional requirement of support for easy configuration and a priori unknowable extensibility of the entire BPP, ii) the implementation machinery to realize an IT plant, and iii) adaptation architecture for individual components as well as the whole of IT plant.

**IT plant Contract Specification** It should be possible to specify a set of concerns such as functional, operational, regulatory, legal, monetary etc, and thus, in essence, forms a contract between IT plant provider and consumer as shown by 4 in Figure 2. From IT plant consumer’s perspective, it should be possible to specify the desired IT needs in terms of all the relevant aspects such as functionality, data, user experience, non-functional characteristics [12] etc.

**IT Plant Testing** At present it is possible to specify application behavior at a higher level from which test cases and test data for system testing with coverage related assurance can be generated. Early advance is underway as regards testing of a product line depicting a set of applications having high commonality and well-defined variability [21]. Automation harnesses for regression testing have been around for years but incremental i.e. change-specific testing is still a problem [22]. Objective of this work-package is to extend these concepts to cover the whole of IT plant as indicated by 5 in Figure 2, i.e., a set of applications, a set of business processes, a set of batch programs, a set of interfacing channels etc. Another, and probably more important, problem is to establish testability of the IT plant. Another aspect of IT plant testing is in relation to satisfaction [23] of IT plant contract.

**IT Plant Deployment** It is highly unlikely that a consumer of IT plant is not already using IT systems. Typically, IT plant will replace some of the IT systems in use. As systems being
replaced (say A) might be interacting with the systems not being replaced (say B). System B needs to be modified as regards its dependence on A system in terms of service calls, data in/out etc. and the IT plant needs to be extended to cater to interfacing needs of system A. Availability demand dictates these modifications need to be undertaken conforming to a partial order and in batches. Identifying both may need analysis of implementation of existing systems and/or execution logs. Having identified the partial order, B systems need to be suitably updated, IT plant suitably extended, and A systems decommissioned [24]. These activities should be automated to the extent possible all the while taking care of underlying technology infrastructure in the IT plant implementation. This is shown by 6 in Figure 2.

V. Early Results with the Work-packages

With enterprise specification and enterprise simulation, we have already obtained some early results. We briefly describe them in the following:

Enterprise Specification and Basic Analyses In our interaction with customers from varied domains and in our experience in delivering 70+ large application we have observed that multiple change drivers are active along the business, IT, and infrastructure dimensions, such as dynamic supply chains, mergers and acquisitions, globalization and regulatory compliances, cloud and mobile technology etc. [25]. We have found it imperative to treat business, IT, and infrastructure dimensions holistically. Enterprise model can help in making sense of enterprise entities individually and from the point of view of the entire enterprise. As described earlier in Section IV, we want to create model of enterprise as a computational representation of business, IT, and infrastructure dimensions and capture aspects such as structure, behavior, and information etc. across these dimensions.

As a first step in creating such an enterprise model we looked into EA frameworks which assist in the process of creating, maintaining, and leveraging architecture of an enterprise [26], for instance, Zachman Framework [27], the Open Group Architecture Framework (TOGAF), Federal Architecture Framework (FEA), Gartner [28], and ArchiMate [29]. Our initial reviews of these frameworks suggested that irrespective of the architectural methodology used by these frameworks, architectural artifacts used in these frameworks are documents used as reference material and are non-machine-manipulable [25]. These frameworks lack self assessment mechanism, i.e., what is modeled cannot be checked for consistency but is correct by definition making them blue-print frameworks [30]. Experienced enterprise architects and other personnel are supposed to use their judgment in this regard.

We have therefore come up with a way to make enterprise models machine-manipulable using enterprise architecture-based ontological representation [31]. Some analyses such as change impact analysis of EA that can be used in application integration effort [14] and landscape map analysis that can be used in business-IT alignment scenarios [15] have already been implemented [32] and tested on reasonably large enterprise models.

We are also working on what-if and if-what analyses of enterprises using intentional modeling [13]. The design decisions behind responses to changes are captured in terms of actor intentions. In our approach, an intentional model of an enterprise devoid of goals is obtained from the existing EA model via mapping. It is expanded by representing the problems due to organizational changes as goals and soft goals and alternative solutions to them. The final intentional model is transformed back to an actionable EA model via the same mapping [33]. As multiple change drivers result in different changes, it is better to treat EA models as the version of truth and use intentional/goal models only as a technique to solve specific problems, arising particularly due to profoundly important business strategy change drivers [34], preserving the reasoning by translating analysis results back to EA models.

Enterprise Simulation We have taken first steps toward enterprise simulation and used it to extend static what-if analyses to dynamic/time-based dynamic analyses. Intentional modeling and system dynamics modeling provide treatment of design decisions at a point in time and over time respectively. We have proposed an approach where both intentional and system dynamics models are used in conjunction with EA models [35] for a more effective treatment of design decisions than provided by either [17].

This early work in simulating design aspects of enterprises using system dynamics has given us some insights into simulating all of enterprise. Our initial results suggest that models of enterprise at every level need to be mapped to concepts of technique used for simulation, such as for example system dynamics.

With regards to the rest of the work-packages such as IT plant specification, we are investigating results obtained and lessons learned from our model-driven practices over the last 17 years [5], [8], [10], [36], [37]. We are still to investigate IT plant contract and testing and deployment work-packages.

VI. Related Work

Servicing of outsourced IT systems in an innovative way as we have suggested is novel in the sense that such outsourcing model and analysis and operational views of this business model in their entirety have not been suggested/ researched previously to best of our knowledge. We therefore take review of key works that we refer to, including online resources since the sentiment that something more than the prevalent labor arbitrage model is required for servicing outsourcing has started surfacing recently.

What should enterprises outsource and what they should not and the benefits and risks involved was discussed in [38]. It was found that labor cost reduction is the most ranked benefit whereas political and legal issues including property rights and contracts were counted as most ranked risks. In contrast to this study which was carried out in 2005, recent sentiment suggests that enterprises are looking beyond cost benefits, specifically to value generation [4], [39] something that analysis world view of IT plant may be able to provide to some extent [40].

How such relationship might exist between enterprises and SPs is being researched as described in [1], [41]. Scoping and scaling of work to be performed by SP needs to be well defined [41] and can take form of strategic relations, co-sourcing alliance, or transaction exchange [1]. It is suggested in [1] that
the relationships stated above evolve and that enterprise must transition from strategic relationship to transaction exchange in a step-by-step manner. This remains to be tested further. We on the other hand believe that once various work-packages that we have suggested have been realized, it might be possible for us to get into any relationship with an enterprise with precise specification of IT plant and enterprise and analysis and operationalization abilities.

VII. CONCLUSION

Current practice services IT needs of enterprises individually and independently. Commonality of IT needs across various business units within an enterprise and across enterprises within a business domain is typically ignored. This leads to bloated IT systems and significant IT cost to business. We have shown how IT needs of enterprises can be serviced using model-driven IT plant product line leading to significant reduction in RTB cost.

Ideally, servicing of transformational IT needs should guide servicing of emergent transactional IT needs. However, typically the transactional and transformational IT needs of an enterprise are serviced independently with excessive reliance on human expertise for the latter. This is arguably the most significant contributing factor to high cost-, time-, and effort-overruns leading to poor and uncertain ROI for enterprise transformation projects. We have shown that the proposed model-driven approach enables in tandem catering of transformational IT needs with certainty and transactional IT needs at significantly reduced CTB cost.

Thus the proposed approach enables a win-win situation for the two key outsourcing stakeholders namely, enterprises and service providers. We outlined the work-packages to realize the proposed approach and presented early results with regards to some of the work-packages.

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