Doing, Learning, Being:

Some Lessons Learned from Malaysia's National Transformation Program

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EXECUTIVE SUMMARY[1]

This study examines an institutional innovation, the Performance Management and Delivery Unit (PEMANDU), for making, monitoring and revising ambitious plans for reform involving coordination between public and private actors and among government entities. These capacities are key to implementing new industrial policies and improving government performance in both developing and advanced countries. For both tasks even the most thorough and inclusive designs for change are likely to be incomplete or faulty, and success depends on institutionalizing a process for adjusting them to unforeseen circumstances, while holding decision makers accountable. PEMANDU originated in Malaysia and has been adopted in various forms in countries as different as Tanzania, India, and South Africa as a possible means to renovate governance and deliver growth.

PEMANDU has developed a regime of procedures and tools:

- Initial goals and provisional but detailed action plans to achieve them are fixed in lengthy (6- to 9-week) workshops ("Labs") that include the key public and private stakeholders in a specific domain, such as the palm-oil industry or the national railway system. The goals are translated into key performance indicators (KPIs). The plans are also "stress-tested" against resource viability and must be approved by a steering committee of decision-makers from relevant stakeholders.

- Progress is monitored in a regular cycle of meetings and committees across departments, agencies and (at times) entities from the private sector or civil society. This monitoring reveals coordination problems or flaws in the initial goals, diagnoses their causes and focuses efforts on solutions. If participants hoard information or reach a deadlock, disputes are "bumped up" to successively higher review bodies. If the deadlock continues, control of the situation passes to superior authorities, with results that may well make all of the participants worse off – inflicting what we call a "penalty default".

- When new information casts doubt on the viability of initial goals, a set of tools and governance processes – including procedures for reconvening Labs or more focused "mini" variants of them – allows for the efficient but accountable revision of projects, plans and targets.

In routinizing the adjustment and revision of its goals, PEMANDU has adapted – indeed, transformed – the UK "delivery unit" idea on which it was patterned. In the original, linear design of a delivery unit, the principal or senior official is presumed to know what needs to be done, and the chief organizational problem is incentivizing subordinate agents to execute the plan. In PEMANDU's variant, the various goals and plans are provisional, and governance mechanisms provide explicitly for their revision in light of information revealed by the efforts of local actors to implement them. Whereas KPIs in a linear delivery unit become in effect ends in themselves—the project fails if the KPIs are not met—KPIs in the PEMANDU variant are used both to maintain pressure to decide and act and to trigger reexamination of goals and the means of achieving them. Projects can succeed even if, after rigorous scrutiny, the initial KPIs are revised or abandoned.

[1] We would like to express our gratitude for the support and guidance of Ivan Rossignol, Chief Technical Specialist of the CIIP, who commissioned an exploratory project and didn't flinch when early returns suggested the utility and feasibility of a more extensive study. At the World Bank we are further indebted to the CIIP task team, led by Suhail Kassim, as well to Christopher Colford for editing support. In Malaysia the project would not have been possible without the openness of Dato' Sri Idris Jala, Ku Kok Peng, Wei Liang Goh, and all the staff at PEMANDU. When we found evidence of problems their reaction was always to dig deeper—never to turn away to avert possible criticism. The same was true of the public sector officials, private firms and civil service members across Malaysia who generously gave of their time. The reviewers who commented during the World Bank review process provided useful references and spared us some errors. We are responsible for those that remain.

We call the PEMANDU variant of the delivery unit "recursive" to emphasize that the output of each round of review and revision is used as the input for the next round of implementation, allowing continuous adaptation and the fluid incorporation of the previously unexpected. Such recursive models of organization assume that information problems are continuous, so that planning and doing must be intertwined. In its emphasis on the limits of *ex ante* planning and the role of local actors in incrementally improving initial plans the PEMANDU model resembles the "problem driven, iterative adaption" (PDIA) approach. But in the PEMANDU model decisions at "lower" or local levels are corrected by judgments at "higher" ones, as well as vice versa. Such models are neither top down nor bottom up; and the need to articulate the reasons for decisions across levels makes possible explicit learning that is hard to achieve when adjustment is tacit and local.

Recursion in PEMANDU's experience is deep and extensive. The CEO of PEMANDU's rule of thumb is that 30% of the initial plans are implemented exactly as they emerge from the Labs; the remaining 70% are revised in implementation. This does not mean that 70% of the initial plans were dead ends, since revisions typically build upon the agreed starting point.

The study below analyses in detail PEMANDU's governance mechanisms and illustrates their operation through close investigation of some of its key projects. The study does not attempt to evaluate PEMANDU's overall performance, for instance by estimating its return on investment; nor does it attempt to estimate PEMANDU's contribution to the performance of the Malaysian economy. The study presents evidence suggesting that PEMANDU has contributed to a measurable improvement in the implementation of certain taxation and regulatory changes, notably in the oil and gas sector, and the execution of several very large and very complex investment projects. In addition it details the early phases of PEMANDU's ambitious program of capacity building and reorganization in paddy rice growing and the cultivation and processing of palm oil. These initiatives are of great importance as the study also found that in Malaysia, as in Latin America and the developed world itself, the provision of services and the production by sophisticated means of natural resource based commodities today demand the same kind of skills as, and help generate the same general capacities as cutting-edge industrial production. They require the same abilities to closely monitor the production process, rapidly correct failures and generalize successes that are characteristic of PEMANDU as well. This commonality facilitates cooperation between the public and private sectors in new industrial policies.

But there are significant cases in both the public and private sectors where PEMANDU's governance mechanisms have failed, in at least one instance because they have been gamed. The study examines several of these failures in detail and suggests ways in which the governance structures can be made more robust.

Some variants of these recursive mechanisms appear to be diffusing with promising effect in diverse contexts; other variants are replicating their form but not their function. One purpose of close study of PEMANDU's governance mechanisms in their home setting is to improve the ability to distinguish the two and encourage the spread of functional equivalents, not mere look-a-likes. In addition, PEMANDU's methods of institutionalizing learning seem to be of a piece with other successful models of planning and implementation, such as the Chinese system of point to surface experimentation, which likewise emphasize the interplay of central and local decision making. A further aim of the study is to begin framing discussion of this class of approaches to reform as a first step towards close comparative study.

In all, the model is hardly a panacea. But given the evidence gathered in Malaysia, it is at least a hope. Indeed, in the sometimes-bleak landscape of designs for the renewal of developed countries and the growth of developing ones, it may even contain the germ of a shared promise.

I. INTRODUCTION

A. Implementation and Industrial Policy

PEMANDU (the Performance Management and Delivery Unit) was formed in 2009 to monitor the Malaysian government's government transformation program (GTP) and economic transformation program (ETP), whose target is for Malaysia to become a high-income nation by 2020. PEMANDU stands at the intersection of the problems of new industrial policy in the developing countries and the improvement of government performance in the advanced ones. Recombining and transforming efforts to address both, it has created an innovative and widely remarked[2] regime for making, monitoring and revising ambitious reform plans.

Where traditional industrial policy assumed that modern economies have a relatively fixed and familiar structure, reflected in static linkages among key firms and industries, new industrial policy, like its close kin venture capital, assumes that sectors and markets are in constant flux.[3] It therefore asserts that what counts as key capacities—those general-purpose abilities that deliberate efforts at economic development should foster—cannot be taken for granted.[4] Where traditional industrial policy weighed the utility of various policy instruments for fostering key projects, new industrial policy generates new forms of public-private collaboration to identify constraints on growth as well as new opportunities for development, and new forms of cooperation to respond to both. But how precisely is this to be done? New industrial policy has developed only rudimentary ideas about implementation. If it was reasonable to doubt the state's capacity to allocate resources guided by a "map" of a modern economy, why be confident of its ability to make such decisions under more demanding circumstances?

At the same time the advanced countries face a crisis of governance rooted in the widespread recognition that traditional public administration by bureaucracy does not work. Top leaders and managers are often captured by outside interests.[5] Even without capture, bureaucratic rules frequently run out in an increasingly complex and rapidly changing world, leaving ever more room for discretion on the front lines. All this is made worse by the traditional fragmentation of administrative jurisdiction—silos: Exactly what is not needed in a world where more and more problems are "wicked" in the sense of requiring coordination across jurisdictional boundaries for their solution.

PEMANDU in its origin was inspired by three sources. One was the "delivery unit" approach to improving implementation, particularly as developed in the eponymous entity in the Prime Minister's office of Tony Blair's government in the United Kingdom; another was the spread of "reform teams" in large corporations'; and a third was the diffusion to the public sector of corporate "project management units" to guide reorganizations. The core idea is that a small, autonomous and highly capable team (the "delivery unit") is tasked with accelerating and improving the fidelity of the translation of a plan into reality across departments—delivering delivery—by convening and connecting stakeholders, and, above all, responding to conflict or

[2] See, for example, McCourt (2012), Iyer (2011), Watson (2012), or Gomez (2012).
[3] The term first gained prominence through its articulation in work such as Rodrik (2004), Hausmann & Rodrik (2003), Hausmann, Rodrik & Sabel (2008), and others.
[4] Though many would argue that the successful cases of industrial policy in prior decades were always closer to the latter task than the former. See for example, Friedman (1988), or the range of articles detailing policy learning in Korea, in Kim & Vogel (2013)
[5] Manning (2010) and Manning & Watkins (2013) provide overviews. Andrews (2013) presents a diagnosis of the difficulties reforming implementation capacity in the developing world, while a recent journalistic account indicates its prominence in the developed (see http://www.ft.com/intl/cms/s/2/aae8d2d0-e594-11e3-8b90-00144feabdc0.html).

inaction by credibly invoking the authority of the head of state. International consulting firms now offer the creation of delivery units as a standard remedy to many of the ills of government.[6]

But in putting the delivery unit model into practice PEMANDU has transformed it into a method of adjusting plans to circumstances, while holding decision makers accountable, and so addressing key implementation difficulties in new industrial policy. The goal of this study is to understand that transformation, illustrate how it works in practice, and begin exploring both its vulnerabilities and the possibilities for its application elsewhere.

B. Two Models of Delivering Delivery

Consider two alternative understandings or models for improving public administration, generally and in the ways required by new industrial policy. The first, linear model focuses predominantly on the need to incentivize and track the achievement of set goals; the second, recursive model reshapes familiar notions of accountability to encourage the re-examination and adjustment of initial goals and the means of achieving them in the light of efforts at implementation.

Both models share a diagnosis of the limits of bureaucracy. At the top of the hierarchy, they assume that senior officials are hamstrung either by ignorance of the particular needs of the parties they are intended to serve, or by political capture by some of those parties, who compel attention to their interests over other, more relevant needs. Mid-level managers and front-line bureaucrats in this common diagnosis follow rules, which (given the limits of knowledge and action at the top) run the risk of being ill-specified or of becoming swiftly outdated. Alternately, when the rules run out or come into conflict, lower-level officials exercise discretion, pursuing either their private advantage or their best guess at the purposes of the organization. Hence, as with rule-following, the exercise of discretion is only incidentally likely to realize official goals. The difficulties of action within any one bureaucracy are compounded by the increasing need to coordinate action across distinct agencies or units (often today referred to disparagingly as "silos") as it becomes clear that firms and families and individuals needs bundles of services,[7] so that isolated services are unlikely to be effective.

It is in response to this diagnosis that the two approaches—the "linear" and "recursive" models—differ.

The first, linear model rests on the idea that the key information problems can be largely solved *ex ante*, so that planning and execution can be neatly separated. The problems of ignorance and capture at the top are addressed by convening a large number of stakeholders to set goals transparently, or by hiring independent experts to "walk through" the operation of the bureaucracy as it interacts with its clients to provide a "customer's-eye" view of shortcomings and of possibilities for reform. The middle- and ground-level problems of rule-following and discretion are addressed by translating the agreed-upon goals and progress toward them into clear targets for progress and precise metrics, then entering into agreements (sometimes implicit, sometimes by way of formal contracts) with senior managers, allowing discretion in the execution of tasks and rewarding progress or punishing the lack of it.

Thus incentivized, the senior managers similarly hold their subordinates to account. Problems of coordination across bureaucracies are addressed by giving top-level officials from different organizations linked goals and incentives. Cross-cutting organizations, such as civil-service or high-level intergovernmental coordination bodies, are suspect as potential cartels of incumbents,

[6] An overview of the trend is found in Manning & Watkins (2013), and other recent and unpublished work by the World Bank's Public Sector Management team. On the original delivery units, and the term "deliverology", see Barber, Moffit, & Kihn (2010). For their rising prevalence in consulting, one might note that McKinsey Global Institute (2014) offers them as a solution (without providing much rationale) to India's governance issues, ranging from agriculture to infrastructure.

[7] For example, help with training and complying with phytosanitary regulations (to firms), or support for difficulties in school combined with support for difficulties at home (to individuals).

bent on defending their authority. Review meetings focus on discipline; authority is invoked explicitly; targets are ends in themselves; and revision is costly and perhaps impossible.

This model de-emphasizes the importance of administrative rules, and even institutionalizes and encourages the exercise of discretion. But, like the bureaucracy against which it is reacting, it remains a linear or principal-agent model of action, in that it assumes that the principal or senior official can confidently know what needs to be done, and the chief organizational problem is inducing subordinate agents to execute the plan.

The second, recursive model likewise initially convenes a large number of stakeholders to develop an initial plan with suggestive but detailed ideas. But in a crucial contrast to the linear model, this plan is regarded as provisional, not definitive.

It and the targets it contains are, in effect, a set of rebuttable presumptions about how and towards precisely what to proceed. Together they initiate activity and discipline a process of monitoring aimed at diagnosing the underlying causes of problems in implementation, some of which may be rooted in the misspecification of the original goals. This diagnostic review focuses on determining what relevant information is missing, how it can be supplied, and what adjustments it suggests. Authority is invoked not to threaten penalties for the poor performance of individuals but to induce deliberative problem solving by participants: If they do not disclose information and deal forthrightly with each other, their disputes will be "bumped up" to successively higher review bodies. If deadlock continues, participants will ultimately be subject to a "penalty default": Control of the situation will be taken away from them and passed to a superior authority, with results that may well make them all worse off. In this model, revision is continuous, both disciplined and enabled by approval requirements and escalating reviews.[8]

Put another way, the model's premise is that information problems are continuous, so that planning and doing are intertwined. Hence guileless confusion about what to do and inability to do it are rife, and easily mistaken for opportunism. The danger of shirking or self-serving behavior is therefore best addressed by creating a regime of rich and regular information exchange among the participants, allowing the parties to distinguish the two, to punish guile and address genuine problems of coordination and capacity. Existing crosscutting institutions, such as the civil service, are seen as a potential source of invaluable information about how government does its work; at best, once the pressure of new tasks and challenges has disrupted existing habits, they can themselves become *fora* for organizing change that is both transformative and organic.

Because this model of organization uses the output of one round of review and revision as the input for the next round of implementation, we call it "recursive." We might also, invoking the philosophy of American pragmatism, call it "experimentalist," to call attention to the way it uses the impact of problems to direct attention to the insufficiency of habitual assumptions and routines and to prompt the exploration of possible alternatives. Or we might equally link it to old traditions of Chinese political theory.[9]

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[8] For the use of similar ""bump up"" mechanisms in the governance of co-development of new products by firms, see Gilson, Sabel & Scott (2009). In contract law default rules are those applied by a court when the parties have not provided terms to cover a contingency. Defaults are typically selected to maximize the joint return to both parties: They are the rules the parties would have ideally chosen for the situation. In the presence of certain information asymmetries, however, courts may impose defaults that penalize the more knowledgeable party if he or she makes strategic use of his or her advantage. The effect of these rules is to induce disclosure of the strategically relevant information. Such information-forcing rules are called "penalty defaults." See Ayres & Gertner (1989) and Karkainnen (2002).

[9] See generally Dewey (1927) and, more recently, Dorf and Sabel (1998). For China, the link is to Daoism, whose insistence on the equal validity of the active (yang) and the passive (yin) were long ago used to explore the interplay of center and region and institution and action in (recursively) mutual redefinition. See, inter alia, Major et al. (2012), possibly linking to the deep foundations of the "point to surface" model (and other institutions) described in the literature on Chinese experimentalism (Xu, 2007; Heilmann; 2008). Our interlocutors invoked Daoism in this way; some of PEMANDU's presentations feature the yin-yang symbol to evoke the connection; and

This analytic distinction obscures overlaps in the actual practices of the two types of organization. Linear models engage in more deliberative problem-solving and even revision of goals, and recursive models make more use of traditional incentive systems than this dichotomy allows. Nonetheless, the distinction is a useful heuristic, as it calls attention to important differences in the way accountability is organized and high authority is invoked that are ignored in discussions that habitually assume that delivery units are a variant of the principal-agent model of organization.

C. The Recursive Model in Context: Neither Top Down Nor Bottom Up

The recursive, experimentalist model is a recently introduced piece in development that rejects universal solutions and argues that reforms must be suited to the particular context in which they are to function. In its emphasis on the limits of *ex ante* knowledge, the model resembles the strand within this literature that stresses the role of local actors in incrementally improving initial plans, or piecing together alternatives, the better to respond to the particulars of the immediate situation.[10] But the recursive model differs from this "problem driven, iterative adaption" (PDIA) approach in two fundamental ways.

The first concerns the nature of learning. PDIA sees adjustment and adaptation as arising principally from what Charles Lindblom, a prominent mid-20th century critic of the rational actor model, called "muddling through". Whereas the text-book decision maker ranks all possible policy options according to their utility, given his values, and chooses the policy means that most advances his goals, Lindblom argues that his real-world counterparts typically compare a few alternatives, all made salient by recent experience, and choose the one that "on the record of past experience with small policy steps" promises the best consequences.

This method of "successive limited comparison" limits the dangers of reckless overreaching and allows for quick correction of modest error. But the method, and the PDIA approach that it inspires, suggests that the same conditions that make the contextualization of policy successful also preclude learning and generalization from local policy successes. Because adaption proceeds tacitly, as tied to local experience as it is disconnected from theory and analysis, when a reform works in a particular place, all that can be said about it is that it works in that place.[11]

In contrast, in the recursive model, the deliberative clash of views obligate the participants at every level—in the initial stakeholders' consultation, in the diagnostic review of interim results, in problem-solving groups formed in the aftermath of review—to begin to explicate and mutually correct their tacit understandings of how and under what conditions things work and what to strive for. In the process they both apply and suggest revisions to current bodies of theory. The idea of the omniscient, rational actor remains a chimera and the explication of tacit assumptions remains partial and incomplete. But the claim is that in making their experiences, objections and solutions intelligible to each other across different levels of governance and across different settings within each level the actors make their successes and failures accessible to outsiders in the broader community of reform as well.

The second and related difference concerns the role of institutions. Where the Washington Consensus assumed the existence of universally optimal institutions, and aimed to induce developing countries to adopt them, PDIA assumes that adaptive institutions result from local exploration. High-level policy makers should therefore be discouraged from speculating about institutional design and should instead foster an "'authorizing environment' for decision-making

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a classic of early Han Dynasty political philosophy states: "If whenever one knew what was right, one's affair would succeed, there would be no unfinished ventures in the world."

[10] For a careful discussion of this contextualizing turn in development, and especially for a comparison of "deliverology" (here the linear or principal-agent variant of the delivery unit model) and PDIA, see Manning & Watkins (2013). For the PDIA see Andrews, Pritchett, & Woolcock (2012) and Andrews (2013).

[11] Lindblom (1959), p.79, 86-87.

that encourages experimentation" and "the iterative feedback of lessons into new solutions." (Andrews et al. 2012, 8)

The recursive model likewise rejects the idea of universally optimal institutions. But it argues that the processes that induce deliberation, and by which contextualized reforms are elaborated and continually assessed, can be usefully institutionalized, with the natural caveat that the general mechanisms will need to be adjusted to suit particular situations. The resulting organizations can be thought of as institutions for fostering the design of (contextualized) institutions, or meta-institutions of reform. Just as the rejection of the idea of context free, optimal institutions does not require nearly unconditional deference to the tacit knowledge of local actors, neither does it require thoroughgoing agnosticism about institutional design.[12]

Figure 1 uses the juxtaposition of PDIA and the linear delivery model in Manning & Watkins (2013), fig.3 to locate the recursive, experimentalist model in the contextualizing discussion.[13]

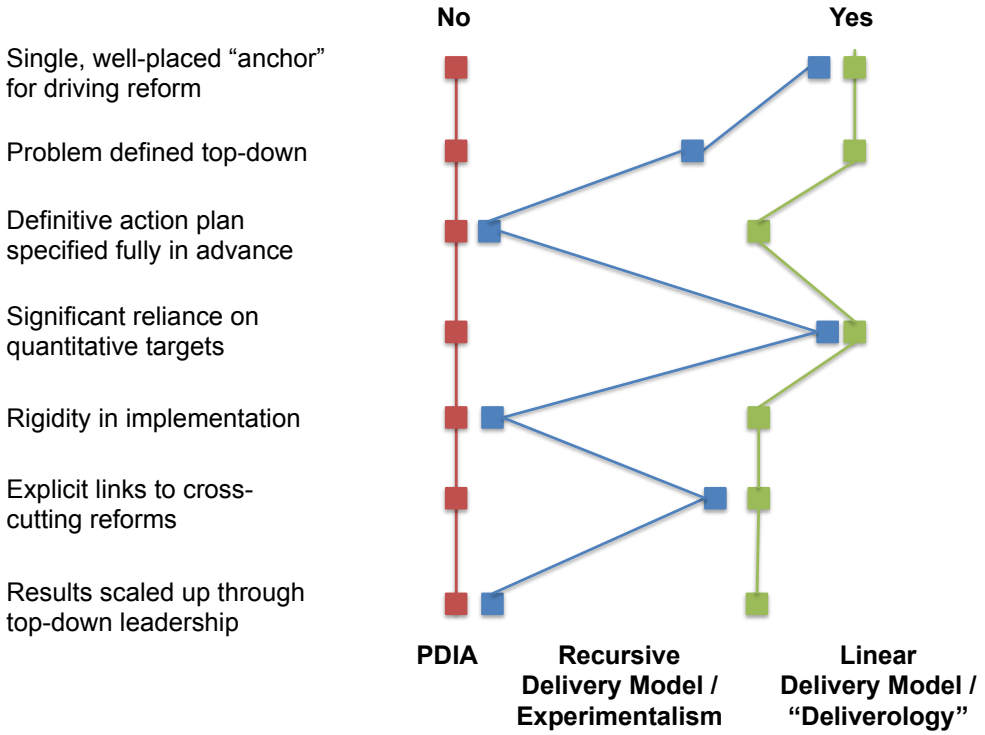
[12] Empirical support for this proposition comes improbably, and therefore with probative weight, from the PDIA research program. Andrews (2013) examined 44 health-sector projects, half sponsored by the World Bank, half by the Global Fund for AIDS, Malaria and Tuberculosis, with one from each sponsor located in 22 countries in Africa and South Asia—the two areas where reform is often considered the most prone to failure. The 17 successful projects scored significantly higher (3.05 of a possible 4) than the less successful ones (1.6) on a "problem focus" index constructed by assigning a point for meeting criteria such as "[a]re baseline indicators of these [locally defined] problems measured in the early stages of the project?" and "[i]s progress in solving problems routinely evaluated and considered in adjusting content?" Scores on a "flexibility" index, including criteria such as is there "[e]vidence of ongoing assessment of progress and results (not just periodic accountability-based monitoring and evaluation)" and "[e]vidence of constant feedback on how well the project is addressing key problems, what lessons are being learned, and what issues are being encountered," corroborate this result. Andrews (2013), 134-39. The underlying process captured in these criteria seems to resemble the kind of deliberative, analytically informed learning by monitoring at the center of the recursive model more than "muddling through." The resemblance to experimentalist learning is still more pronounced in this capsule description of a World Bank project in Nepal that delivered satisfactory results amidst considerable political turmoil, in part because

> The problem was framed in visible data to which politicians and bureaucrats were sensitive—about outcomes (how many children were dying of measles because they had not been immunized, e.g.) and outputs (how many hospitals were functioning in rural areas, for instance). These problems and indicators were a rigid focal point, and beyond this the project was quite flexible. Its technical content, milestones, and even final goals were adjusted at various points as contextual constraints materialized and changed. Andrews (2013), 136-37.

The account does not say whether the process of technical adjustment and resetting milestones and goals was formally institutionalized. But as we will see in detail below the experience of PEMANDU demonstrates that such institutionalization is certainly not inimical to, and plausibly furthers local contextualization.

[13] For ease of exposition we omit consideration of the public sector reform management program PSRM), presented in Blum, J., Manning, N., & Srivastava, V. (2012). For discussion of PSRM see Manning & Watkins (2013), which notes the controversy concerning the possibility that this program perpetuates key aspects of the Washington Consensus in a new form (ibid, 14).

FIGURE 1



The findings presented here show that the ETP and GTP, and PEMANDU within them, operate in a recursive way rather than a linear way, and that recursion is institutionalized in ways that foster the generation of articulate, often formalized knowledge at many levels. By providing a set of tools for generating and exchanging information, the unit has helped create an organizational model that allows actors to revise their own goals and routines while maintaining discipline and momentum.[14]

How it has done so, how its governance arrangements have inadvertently failed or been successfully gamed, and broad areas where it could still improve, should thus be of substantial interest for both public management and for the devising and steering of "transformation" programs of varying scope. The experience of Malaysia and PEMANDU, moreover, sheds light on, and are illuminated by, a range of experiences elsewhere, such as the recursive or experimentalist elements in Chinese industrial policy or emerging experiments in developed-world governance.[15]

D. The Familiar Problems of Preconditions and Attribution

Assertions of this kind raise two familiar questions.

The first question concerns pre-conditions. In what ways does a society or state have to be "Malaysian" in order to create a PEMANDU-style delivery unit?

[14] This is notable since, especially in its earliest years, the unit was often seen as—and presented itself as—much more akin to the first model, and as a challenger and potential successor to the civil service.
[15] The former as the "point and surface" model cited above (and discussed at further length in the conclusion); on the latter see De Burca, Keohane and Sabel (2014) or, at smaller scale, in state-level innovations in the US, such as Statestat in Maryland.

We explore some specific attributes below, such as cultural attitudes to obstruction, which may have favored PEMANDU's efforts. But a very general response is to note that, if minimal threshold conditions are met, the system of bump-ups and penalty defaults induces cooperation, rather than assumes a disposition to cooperate: The model thus helps generate or re-enforce some of the conditions it needs for success.

Those threshold conditions are threefold. First, the political and economic elites must in fact be committed to improvement. If their true aim is predation or defense of the status quo, they will only build a PEMANDU for show. Second, the civil servants or public sector employees who are the co-protagonists of reform cannot be uniformly hostile to it. Positive variation—the widely observed phenomenon that even in low performing economies some public and private units function better than others, and are capable of further improvement—strongly suggests but cannot assure that this condition is met. Third, at least some firms must be acquiring, or disposed to acquire, the kind of recursive capacities that PEMANDU fosters. Joint, public-private efforts to identify problems and opportunities can only be fruitful if there is some shared sense (even if initially very thin) of the direction of development and the general capacities it requires. The widespread recognition, noted at the outset, that participation in global supply chains and world markets requires continuous improvement and learning likewise suggests that this condition will often and increasingly be met.

More particularly, note too that Malaysia's economic history does not point to some unique combination of institutional and cultural endowments that foreordain success. On the contrary, the country's experiments with traditional industrial policies had a distinctly mixed record. It failed, for instance, in attempts to build steel and auto industries. These failures were not complete. In some ways, we will see, they left institutional legacies that contribute to the success of the current policy. Many developing countries, and not a few developed ones, have failed (incompletely) at development, and in this sense there are potentially many Malaysias. In any case, PEMANDU-type institutions learn from and adapt to particularities of their environment, so in theory (and given the threshold conditions) it should be possible to establish them across a range of settings.[16]

The second question concerns attribution, particularly for economy-wide outcomes such as growth rates and investment trends: How much impact has PEMANDU had? Such questions are notoriously difficult to answer, and they have still not been resolved even for historical cases such as MITI in Japan and the CGP in France.[17] In the case of Malaysia, PEMANDU's actions would not be possible were it not for the emergence, in the economy and in some parts of government, of organizations that operate on cognate principles: Firms, farms and some government entities in Malaysia are increasingly improving their operations by use of their own recursive information-exchange regimes. PEMANDU, as we will see, is plainly accelerating and reinforcing such changes, which in turn bolster its own effectiveness. This kind of co-development, in which

[16] Andrews (2013) is again corroborative. He finds that "[p]rojects in the same difficult contexts can yield vastly different results, sometimes proving quite successful and even sparking institutional adjustments.(133) In fact, of the 17 World Bank/Global Fund health-care projects in the sample whose performance was rated "more than adequate," 13 were in countries where the other project in the sample was rated "less than adequate." (134). Outcomes plainly depend on project design, not context. Other recent writing informed by field experience also suggests that reforms in harsh contexts can succeed if they "work with the grain", leaving, in the manner of "small bore" reforms, many if not most of the formal structures of the civil service and public-sector management untouched. See World Bank (2012) for a summary of the motivation for and routes towards such reforms; for a detailed example, see Srivastava and Larizza (2012).

[17] Posen (2002) provides a (skeptical) summary of the (large) quantitative literature on Japan. On the CGP, among more recent scholarship, Piketty (2014) implicitly denies that the success of *la trente glorieuses* can be attributed to policy intervention. He holds that France's postwar growth was an "automatic" rebound.

causality flows from cause to effect and back, plainly vitiates the attempt to attribute effects to independent causes.[18]

But if such circularity makes it impossible to determine rigorously whether PEMANDU makes a contribution to the overall economic performance of Malaysia, it is feasible, in principle at least, to estimate the effect of applying the PEMANDU "treatment" on one sector or sub-sector of the economy by comparing development outcomes there to results in an (almost) identical "control" group to which it is not applied.[19] Such tests, if they are possible at all in Malaysia, are beyond the scope of this project. As a practical matter, what can be probed is whether, in the areas of PEMANDU's concern, its activities are leading to at least more rapid implementation and at best a catalyzing of capabilities. We will use case studies to illustrate how such dynamics develop, the concrete results to which they lead, and some of the circumstances that obstruct them.[20]

E. Three Domains of Problem Solving

These case studies regard three types of challenges.

The first, and to some extent the most conventional, challenge has to do with changes to regulations or improvements in tax and other type of rules, which require a one-off agreement on the change followed by its enactment in practice. Although perhaps the simplest type of problem, even it can often require PEMANDU's institutional machinery of bump-ups and penalty defaults, to make it easier for the various parties to resolve familiar kinds of conflicts and to ensure they deliver on their agreements. This activity falls under the rubric of "improving governance." Examples might include introducing tax incentives for enhanced oil recovery or a subsidized replanting program for palm oil.

The second challenge involves very large projects, where the principal actors (public and private) already have a clear view of their internal capacity to make, enact and revise plans, but where execution is liable to generate unforeseen problems that necessitate the repeated and time-bound striking of new agreements and new regulatory accommodations. Examples here would include the construction of a mass rapid-transit system (MRT) or a large oil-and-gas trading terminal, both requiring extensive regulatory problem-solving across departments to ensure timely delivery.

The third challenge occurs where the actors lack a crucial capability, namely the ability to learn and change recursively, and where the attainment of a crucial goal is hindered by this flaw. PEMANDU's role here is to help those actors acquire and develop PEMANDU-style monitoring and self-recursion. This challenge is the most difficult of the three but is probably the most important for the long-term prospects of development. Examples include the introduction of good agricultural practices in rice and palm.

Drawing on these problems, the remainder of this study describes the results of an examination of the ETP and PEMANDU as it operated in 2013 and 2014. It is based on three field trips, including a range of site visits and forensic interrogations of government officials, private-sector firms and PEMANDU staff members. It draws on specific literatures on delivery units (including prior work on the ETP and PEMANDU), as well as on general literatures on public management and industrial policy.

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[18] Moreover, there are many exogenous factors (e.g., global demand conditions) and endogenous factors outside of PEMANDU's control (e.g. PETRONAS' pre-ETP capex decisions) that affect macroeconomic performance and make attribution of a specific program or agency impossible.

[19] Under near-laboratory conditions, such tests can be conducted statistically (see Bloom et al., 2013). Under real-world conditions, however, it is almost impossible to tell (outside of a forensic case study) whether the treatment is recursive or linear, and what its effects truly are.

[20] Cf the observation in Manning & Watkins (2013), 8: "Realistically, we are not going to see a large dataset of well-measured [contextualizing] interventions which can be contrasted with other, more "best practice" approaches any time soon. An initial understanding of the significance of the approach will more likely be obtained from case studies which analyze the impact of these approaches on different problems within different country contexts."

Section 2 provides a brief history of the transformation program, from the context and motivation of its founding in 2009, through some of its early successes and failures, and its experience up until today (with a box describing how, in the case of police reform, the generally reliable system of indicators broke down). Section 3 describes in detail how PEMANDU's core processes of coordination (the "bump-up" and the "penalty default") and revision ("70/30") work. Section 4 provides deep dives into the three domains of problem-solving just described, while Section 5 examines the relationships among PEMANDU, the civil service and the Ministries (with a box describing how the Ministry of Education has been able to create a simulacrum of the PEMANDU governance system while remaining accountable only to itself). Section 6 describes some of the limitations and areas for potential improvement for the program and the unit. The Conclusion returns to the themes of this Introduction, considering some lessons for the implementation of new industrial policy, the reform of public management, and economic development overall.

II. THE STRUCTURE AND OPERATION OF THE TRANSFORMATION PROGRAM

A. Founding Context

Since independence in 1957, Malaysia has been governed by Barisan Nasional.[21] Its fourth Prime Minister, Tun Mahathir Mohamad, governed Malaysia for two decades, from 1981 to 2003.[22] Under Mahathir, Malaysia undertook an ambitious range of traditional industrial-policy programs. The two most prominent focused on the attraction of foreign direct investment (FDI) in export-oriented manufacturing, especially the development of a large electronics growth pole in the Penang region, and efforts to develop "national champions" in mass manufacturing and heavy industry, most contentiously in steel and automotive (with the Proton car company). The first of these was more successful than the second, but an inability to move up the value chain from assembly would hobble development in the growth pole in the late 1990s and 2000s, amid the emergence of China.[23]

In the pursuit of his industrial policy and other programs, Mahathir centralized decision-making, relaxing the grip of the civil service on policy[24] but also building extensive links with and among the private sector. He termed this "Malaysia Inc.," and he was its undisputed chairman. At worst, such links became forms of damaging capture; however, at least on the margins, the capacity of private-sector organizations to self-organize and engage in policy dialogue with government officials was strengthened, creating some of the foundations for the public-private interchange that would later underpin PEMANDU.

The end of Mahathir's tenure coincided with the Asian Financial Crisis and rising political contention. Under his successor, Prime Minister Tun Abdullah Ahmad Badawi, the headline rate of growth in the mid-2000s continued to be strong. The manufacturing sector showed increasing signs of strain, but Malaysia continued to be, by a large margin, the highest-income economy in South East Asia (excluding Singapore).[25]

A cadre of strong civil servants became higher officials. The service returned to a more central role in decision-making,[26] as manifest in the formation of PEMUDAH, a task force that brings together representatives of the private sector and the civil service to reform business regulation. PEMUDAH's organization and capacities prefigure elements of the ETP and PEMANDU. Under it, Malaysia has steadily progressed in the "Doing Business" rankings and similar surveys.[27]

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[21] A coalition whose largest party is the United Malays National Organisation (UMNO).

[22] Following the third Prime Minister Tun Hussein Onn, who ruled from 1976 to 1981.

[23] This draws most on Jomo & Sundaram, 2007, although Malaysian industrial policy in the 1980s and 1990s has been widely discussed and debated in the broader development literature, including World Bank (1993).

[24] Jomo & Sundaram (2007), especially Chapter 5, as well as Felker & Jomo (2007)

[25] Malaysia's GDP per capita (at $10,400 in 2013) is almost double Thailand's ($5,370), almost three times Indonesia's ($3,580), and six times Vietnam's ($1,730). All figures reported in current U.S. dollars at market exchange rates (Atlas method), from the World Development Indicators.

[26] A wide range of stakeholders—public and private—throughout our interviews expressed appreciation for the senior civil servants with whom they dealt, though this admiration tended to fade when they were asked about mid-level officials. It is beyond our scope to determine which the case is, but this may be a structural effect or happenstance. If it is the former, it may be due to promotion processes selecting well or a strong pipeline of potentially higher-ranking civil servants several years ago.

[27] PEMUDAH was launched in 2007 in a speech by the Prime Minister to the Civil Service. In 2013, Malaysia became the highest-ranked developing country in the "Doing Business" survey, moving up to 6th globally. Beyond that survey, PEMUDAH has been active across a range of sectors, with joint action by its private-sector members and the civil service. Its early and continued momentum were ascribed by current members to the Chief Secretary to the Government at the time it was set up, sustained by the general capacity for public-private interaction that is one legacy of "Malaysia Inc."

In the watershed March 2008 general election UMNO's vote share dropped sharply. The opposition grew from 22 to 82 seats in parliament (out of 222), and took power in five of 13 states. Six months later, the global financial crisis began, and Malaysia's GDP growth collapsed, falling from an annualized 7.4 percent in Q108 to -6.2 percent in Q109.[28] UMNO's majority was at risk unless it succeeded in restoring growth and in addressing urgent public concerns such as crime and corruption.[29]

The party turned to Dato' Sri Najib Razak who became Prime Minister in April 2009. The son of Malaysia's second Prime Minister (Tun Abdul Razak), Najib Razak rose through UMNO's youth wing, held his first Ministerial portfolio at age 32 in 1985, and later headed a range of government departments from Education to Defense.

Najib Razak launched the "1Malaysia" campaign to promote ethnic harmony and economic growth. These goals required a transformation of government. To that very general end, he created a new cabinet post, the Minister of National Unity and Performance Management, to which he appointed Koh Tsu Koon, then president of one of the coalition parties. A series of intensive retreats and workshops with the entire Cabinet followed, to see if a common understanding of goals could be reached, facilitated by consultants and key leaders of 'government linked companies'. A few participants were enthusiastic about the prospects of reform; many more were willing to engage, and few if any were adamant opponents.

The result of the retreats was a set of goals and programs for a "government transformation program" (GTP) focused on issues such as crime, education and rural infrastructure. PEMANDU—the name of which also means "driver" in Malay—was created to monitor and facilitate the execution of the program.[30] To lead it, Najib Razak and Koh recruited Dato' Sri Idris Jala, then the head of state owned Malaysian Airlines and with a record of turning around struggling business units of the oil company Shell Oil. Idris Jala—who had been part of the workshops but resisted accepting the post at first—maintains today that the whole-of-Cabinet approach of early and deep involvement of all political principals was vital to PEMANDU's later activities.

Under continued public pressure to restore strong economic growth, and with a favorable reaction to the GTP, the "economic transformation program" (ETP) was formulated in mid-2010.[31] The ETP built upon the New Economic Model (NEM), approved in March 2010, which set a goal of raising annual income per capita above $15,000 by 2020, from $7,590 in 2009.[32] The NEM and ETP also added the goals of "inclusivity" and "sustainability," although it is the income target that has become most embedded in PEMANDU's operational processes. Idris Jala refers to it as the "true north," which provides the long-range discipline that enables short-term flexibility.[33]

Although the GTP and ETP are conceptually and formally distinct, with the GTP more focused on public service delivery and the ETP on policy reforms or public-private projects in industrial policy, the processes used to devise, detail and implement have been almost identical, and in practice particular transformation programs routinely straddle these boundaries. Transport improvements or education reforms, for example, are catalogued under both types of activity. In addition, new industrial policy interventions typically combine components involving public- and private-sector interventions, further blurring the boundary between the GTP and ETP. A classic case of this—in Malaysia and elsewhere—is a tourism growth pole, which requires (among other

[28] Department of Statistics, Malaysia.
[29] McCourt (2012).
[30] See Lesley (2014) for more detail on this background.
[31] Ibid., as well as Xavier (2013).
[32] The ETP has sometimes been presented as restricted to the implementation of the NEM. However, as discussed later, the overlap is not exact. Some of the NEM "strategic reform initiatives" (SRIs) are not included as SRIs in the ETP, while a range of ETP projects are not part of the NEM. In this study, the ETP will be studied on its own, rather than being judged on how it did or did not fare in implementing the NEM.
[33] In that regard, it is reminiscent of the demanding goal setting in other flexible units, which is one of the strategies that a range of organizations have used in implementing flexibly (Jordan & Koinis, 2014)

actions) public reforms in visas, border control and licensing regulations; private investments in single-user infrastructure; and joint investment in multi-user infrastructure.

Thus, despite some differences in nuance that we will note later, an emphasis on the differences between the GTP and the ETP risks confusing form with function. The three categories of PEMANDU intervention described in Section 1 are based on tasks and the capabilities required to execute them as developed inductively from the observed patterns of effectiveness, regardless of the boundaries across formal programs. That said, given the motivation of this study, we have concentrated on cases that fall more within the purview of the ETP than the GTP.

B. Goal-Setting: NKEAs, SRIs, Labs and KPIs

The process by which PEMANDU established goals in its first year or two have been described at length by the agency itself and by researchers.[34] We recall them here only in brief, focusing on underexposed aspects of the organization of Labs.

The program is formally divided into "national key economic areas" (NKEAs) and "strategic reform initiatives" (SRIs). In development discourse, these translate respectively into "vertical" initiatives, focusing on specific industries or areas, and "horizontal" initiatives, focusing on cross-cutting reforms.

The NKEAs were chosen for their potential contribution to the GNI target. AA mix of global and national average growth rates for each sector of the economy was applied to its then-existing GNI, aiming to arrive at a possible aggregate-income contribution. The sectors were ranked by this contribution, with the largest 11 chosen, plus the geographic area of Greater Kuala Lumpur (GKL), for a total of 12 NKEAs. These are listed in Annex B. This process naturally led to the selection of a mix of the large sectors dominating Malaysia's economy, and smaller or medium-sized ones that had posted strong growth in Malaysia itself or globally. The large sectors included, in particular, "the big three" of palm oil, oil and gas, and electronics, which together account for 64 percent of Malaysia's exports, 28 percent of its GNI and 9 percent of employment.[35] The smaller or medium-sized sectors ranged from tourism to healthcare. The list was rounded out by essential services, namely wholesale, retail and financial services. Each NKEA was then scrutinized in a process of sustained stakeholder engagement, to validate their targets and to break them down into "entry point projects" (EPPs).

The central step in this process was convening "Labs"—one for each NKEA. In a full-scale Lab, a dozen or more key stakeholders are assigned full-time for nine weeks to collectively devise an action plan to realize the NKEA goal. Labs are designed to be non-hierarchical, anchored by quantitative analysis, and stubbornly focused on the pursuit of solutions. As PEMANDU officials sometimes put it, "You are locked in a room, and you don't come out until everyone agrees on a plan with quantified targets."

Managing such a process is a craft of its own. Failure is costly. Because of the technical demands and high stakes in the first few years, the Labs were facilitated by high-end management consultants, and they required a substantial budget that could only be committed by waiving standard public-procurement rules. Today PEMANDU has internalized this capacity so that most of its teams are capable of running Labs of varying formats themselves.[36]

[34] For example, McCourt (2012), Iyer (2011), Watson (2012), etc.

[35] PEMANDU and the Department of Statistics Malaysia's Internal Statistics

[36] Brief observation of a recent Lab indicated PEMANDU staff in Malaysia to be highly skilled in facilitation. The lead facilitators, for example, used quite sophisticated forms of role-playing, goal formulation and questioning. Some departments and organizations outside of the ETP are now calling on PEMANDU's assistance in lending these skills to their own, internal change processes (as, for example, in the Lab which we witnessed first-hand, being that of the state-owned rail company).

Two features of the Labs are of particular importance. First, although they are sometimes portrayed as moving from big goals step-by-step in a linear process toward detailed plans, in practice the Labs have recursive features. Broad solutions identified in the first two weeks can be dropped (or new ones can be added) as specific projects are defined, while further additions and subtractions are made as those projects are converted into specific plans. But there are limits to the fluidity at this stage: facilitators estimate that only 20 percent to 50 percent of the original solutions are revised within the Lab, a much lower level of revision than occurs after it (see Section 3c.)

One spur to revision is the supply of fresh information: As participants come to know and trust one another, they bring to the fore knowledge of problems or solutions that, at the outset, they may have held closely to themselves. A second impetus to revision comes from testing solutions against budget possibilities.

At approximately the halfway mark, the Lab as a whole will have a meeting with senior officials (sometimes the Ministers) of the Treasury and the Economic Planning Unit.[37] These are presented with the Lab's proposed projects to date, along with order-of-magnitude estimates for their cost. The visiting officials then question the rationale and details of the projects in detail, and provide informal guidance on what is feasible in that and following years' budgets. This meeting, sometimes called the "stress test," often leads to substantial revision, as projects are altered in scale or even dropped. Along with a formal presentation to the budget departments at the end of the Lab, this session also helps mitigate the risk that the Labs might become divorced from the reality of the budget and planning processes.[38]

Another risk is that the Labs may reinforce patterns of inclusion and exclusion among stakeholders. The Labs require a substantial commitment of time and expertise from the leadership of civil society organizations, firms and trade organizations, and government. For organizations that have limited resources and that are unfamiliar with other stakeholders and with such processes, participation may seem like an unacceptably risky investment. Such hesitation may skew effective engagement in Labs in favor of those firms, labor groups and civil society organizations that already have ways of voicing their views. But recursion mitigates the risk of excluding marginal organizations. In a linear process, those not included from the outset are excluded for good, but recursion allows for contestation and change in later stages.

An additional risk is that the Lab can only bring to the surface and use information held by those in the room. If all participants have long experience in the status quo, they may tend to herd around solutions or projects that are outdated by the point of launch (as occurred in electronics).[39] Put another way, if successful transformation requires wholly new capacities of which those in the Lab are unaware, or which they may resist by habit, then the EPPs generated may be backward-looking rather than forward-looking. But again these problems would be more burdensome if Labs determined all that followed, rather than defining a starting point for further elaboration.

Despite these risks, there are many problems—principally, those involving coordination among holders of current knowledge rather than deep disagreement about strategy or the need for bold exploration—where Labs result in detailed, granular plans with a high degree of common ownership, coherently linked into the budget process. Since this was the case for many of the

[37] In Malaysia's budget process, the Treasury (in the MoF) authorizes operating expenditure and plans finance, while the EPU authorizes development expenditure.

[38] There have been reports that some "Labs" in other countries, run by consultants (and at times with PEMANDU's involvement), may—through lacking the "stress test" or other mechanisms to link to the budget and the expenditure framework—be falling prey to this risk. More generally, a "Lab" (even a sequence of them) without the other processes managed by PEMANDU is likely to be, at best, a pointless exercise, and, at worst, a damaging distraction. We will return to the question of presentation and extensions abroad in Sections 6 and 7.

[39] In theory, the inclusion of participants from global consultancies or development agencies might ameliorate this, but in practice they operate at one remove from deep shifts, especially if they follow a model of deploying generalists intended to draw on more distant specialists.

NKEAs, we found that the EPPs that formed them enjoyed a high degree of legitimacy across stakeholders.

Once the Labs are complete and the EPPs are specified, the plans are shared publicly through an "open day" process, and then they are integrated into a single ETP "roadmap." (A similar process had likewise resulted in a GTP roadmap.)

The operative core of the roadmap is a set of key performance indicators (KPIs): a mix of output and outcome targets. They range from palm-oil yields to investment-attraction targets to project-completion milestones for large infrastructure. For the GTP, they are assigned primarily to Cabinet Ministers, while for the ETP they are assigned to the "owner" of the relevant EPP, which can be either a Ministry or an agency (such as the Malaysia Palm Oil Board, the MPOB, or the Malaysia Petroleum Resources Council, the MPRC).

C. KPIs and Their Limits

Malaysia is on track to meet the ETP's income target by 2020, and perhaps even before that date. The economy has been growing at more than 4 percent per annum, public and private investment is high in absolute terms, and GNI per capita has risen to USD $10,060 in 2013 (at current prices). GDP growth in Q1 2014 exceeded expectations, at 6.2 percent year-on-year, although high levels of household debt—linked to a frothy housing market—have been a cause of rising concern.[40]

The results for specific KPIs are mixed. In the transformation program's most recent annual report, the KPIs of the ETP and GTP are recorded as being met at an average "104 percent" (Annex 2). However, this is calculated as a simple average and does not weight for significance, meeting project milestones versus achieving larger outcomes, or data quality. Among a sample of 13 of the original targets from the 2010 GTP, roughly two-thirds were met in 2011 and roughly one-half were met in 2012. Indicators that did not meet their targets, in either year, did register gains in absolute performance in the period (for example, the public transport modal share in KL increased from 10 percent to 12 percent in 2009 to 21 percent in 2013, but this was below the original target of 25 percent).[41] In the ETP, similarly, in the key sectors of oil and gas, palm oil and electronics, approximately 70 percent of the core KPIs are being met.[42]

But, of course, it is not the case, simply because KPIs are rising or targets are being met, that the underlying sector or program is in strong health.

First, even when KPIs accurately reflect developments, progress can be tenuous. For example, the GTP had an early success in rationalizing the deployment of police officers, leading to a more than 20-percent drop in reported crime rates. However, between criminals adapting to the new police patterns and the liberalization of the rules for detention, crime has begun to rise again.

Second, a KPI may reflect a questionable project. This, for example, seems to be the case for the dairy program. Malaysia does not have a climate conducive to raising cows, and the country meets only 5 percent of its milk demand domestically.[43] One of the KPIs is to raise dairy yields to 15 liters per cow per day. At present, the average is just over 12, and it is said to be rising roughly in line with targets. However, in dairy-suited countries, the average is above 20 liters per cow per

[40] See, for example, the articles at http://www.reuters.com/article/2013/07/30/fitch-revises-malaysias-outlook-to-negat-idUSFit66566620130730 and http://www.ft.com/intl/cms/s/0/d22a8580-bb39-11e3-948c-00144feabdc0.html (both accessed June 1, 2014). As noted above, we cannot say whether the fact that the ETP's macroeconomic targets are being met implies that either the transformation program or PEMANDU itself could claim the credit. Conversely, should the housing and credit-related risks materialize and lead to macro volatility it would not nullify the underlying and sector-specific achievements that are more directly linked to it.

[41] The authors are grateful to Willy McCourt for this analysis.

[42] In oil & gas all but one of the KPIs are being met at a threshold of 90% of target or above. In palm oil that figure drops to roughly half (5/11), while in electronics almost all are meeting their targets. The other, smaller sectors tend to have met all their KPIs, e.g., as in tourism and wholesale & retail.

[43] De Schutter (2014)

day and best-practice countries approach 30 liters—levels that Malaysia is unlikely ever to approach.[44] The program may then be diverting resources and attention from more ambitious but more feasible programs elsewhere in agriculture, as will be discussed below. Box 1 describes an instance where both of these governance weaknesses may be at work, in the "black spot" program within the Crime NKRA.

Third, meeting a range of KPIs may not mean that the underlying health of the sector is improving. This is perhaps most noticeable in electronics, perhaps the most challenging of the NKEAs. The current KPIs principally track discrete investments (though some will have collateral benefits), most of which are being approved and committed, so that the sector's KPIs are "90-percent met."[45] The NKEA's "outcome" KPI of total investment in the sector is also being met. Few observers, however, would characterize this as representative of the health of the sector.

Finally, a KPI may come to be outdated, as a result of changed reality or new information, such that rigidly testing against original targets may be counter-productive.[46] This is a fundamental tenet of recursion, although it requires a disciplined revision process to avoid becoming a means to disguise non-performance—and, even then, the revised KPIs may still have weaknesses. In electronics, again, the current KPIs are the result of several rounds of revision.

These examples are meant to caution against uncritical interpretation of the KPIs, whether positive or negative, or whether they might be classified as "outcomes" or "outputs." They are utilitarian, rather than normative, their purpose being to serve as a management tool. As described in the next section of this analysis, their best use is to discipline recursion, to induce collaborative problem-solving, and to bring needed information to the surface.

[44] US production is 23 litres / cow / day.
[45] As quoted in the National Transformation Program Annual Report, under the "method 3" (reported as more conservative).calculation.
[46] Perhaps the most striking and well-known example of this comes from outside Malaysia, in the Chinese government's revision of its GDP growth target from 8% p.a. to 7.5% p.a. If performance were rigidly measured against original targets, China's necessary rebalancing and cooling of growth would then be counted as failure.

BOX 1: The "Black Spots" Program

The crime NKRA was one of the GTP's earliest apparent successes. In 2010, street crime fell by 37 percent, and overall crime by 16 percent, against respective targets of 20 percent and 5 percent. The gains were largely driven by deploying beat officers to "hot spots" (concentrations of crime)—a strategy used in a range of U.S. cities. As in the United States, the gains in Malaysia were limited and tenuous, as criminals adapted to the new deployment patterns. In 2012, for disputed reasons, there occurred a spike in violent crime. The combined effect of the modest gains from hot-spot policing and the spike in violence was a deterioration in public perceptions of safety.

One of the high-priority responses is the "black spot" program. It is based on the "broken windows" theory of policing formulated by George Kelling and James Q. Wilson. The strategy is to prevent the emergence of hot spots in transitional neighbourhoods by eliminating signs of disorder that might attract wrongdoers, and by enlisting law-abiding people to cooperate with the police in order maintenance. There is little firm evidence of the effectiveness of this strategy in the United States.[1]

In Malaysia, the analogous program concentrates on areas perceived to be dangerous, and provides funding to the local government for a range of small improvements to public spaces. In the "black spot" we visited, this meant repaving and lighting some alleys, as well as installing steel guardrails along some busy streets. The intervention was reported to have led to a decrease in fear of crime, but it had no noticeable effect on reported crime rates.

In fact, the "black spot" we visited was an immigrant neighborhood, not a hot-spot centre of crime. The concentration of immigrants gave rise to the perception—apparently among middle-class urban residents—that the area was unsafe. A resourceful local government used the program to obtain additional funding for local improvements that were presumably of some value to the residents of the neighborhood and to middle-class bystanders. The program, harmless in itself, also however claimed the attention of some senior police officers—a resource that could have been devoted to more difficult but ultimately more rewarding tasks, such as developing and implementing new techniques of policing in areas that experienced high concentrations of crime in reality, not just in the perception of some observers.

Yet the program is meeting its KPIs for output measures—public investments made—and for outcomes—perceptions around the "black spot". On that basis, in fact, the program had apparently survived recent scrutiny regarding its value.

The program illustrates that progress on KPIs, even within an NKRA often deemed a success, is a reliable measure of success only when PEMANDU's tools of self-interrogation and correction are applied with rigor. When not, the result can be programs that are of questionable value, and perhaps even costly distractions.

III. RECURSIVE IMPLEMENTATION: BUMP UPS AND PENALTY DEFAULTS

A. Personnel: Numbers, Recruitment and Training

Today, PEMANDU employs 135 staff (including 33 support personnel). Idris Jala remains the CEO, and the Prime Minister announced after the 2013 elections that he himself would become its Chairman. Formally, the unit is incorporated as a government owned company, which provides it some flexibility in hiring and procurement, though it is still subject to transparency regulations. Idris Jala also holds cabinet rank as Minister in the Prime Minister's Department.

Reporting to him are 13 directors, three for the GTP, five for the ETP, and eight with two or more portfolios across the GTP and ETP. Some also play functional roles (for example, the director of the Palm Oil NKEA is also the director of investment attraction as well as innovation). The directors are drawn from an eclectic range of backgrounds: some were senior civil servants; some were managers in state-owned companies or independent agencies; some were consultants; and some were operational managers in the private sector. Seniority among stakeholders or a background in the relevant industry seems to be more important the larger or more technical the program. The directors are supported by a team of "associates" for each program. These are relatively young and primarily have a background in the private sector, though several also come from student politics or the civil service.

Salaries at senior and junior levels are described as "competitive" on entry, which was considered important to attracting talent at the outset.[47] However, a range of staff reported that PEMANDU's reputation is such that they receive a flow of offers and could now receive higher salaries outside. They choose to remain on account of the culture, sense of mission and achievement in the unit. Few if any staff consider the unit a permanent home, but rather as an opportunity to make a difference, acquire new skills and networks and possibly facilitate a career shift.

As such, there is a constant turnover at all levels: the average tenure of directors is 3.3 years, and of associates it is 2.5 years.

Despite this turnover, on entry there is little formal training. Staff reported that they picked up the PEMANDU way quite quickly from their teammates.[48] Most training is therefore on the job, with staff (especially associates) selected principally for a capacity to learn, react and to interact credibly with key stakeholders as well as enthusiasm for the organization's mission.

B. Nested Cycles of Monitoring

The unit manages a set of processes that can be described as a nested set of monitoring routines reinforcing and disciplining each other (Figure 2). They begin with weekly reports on the KPIs of each project. During the week the PEMANDU teams liaise with the owners of each EPP to request updates, especially any change in the metrics being tracked, any significant events that have occurred, and an explanation of why the metrics have or have not changed. The current state of each metric is then compared to the target for the period, and color coded as completed (green), on-track (orange), or falling behind (red).

The metrics and salient information are compiled into a template that by Friday afternoon is fed into a common database, linked to both a website and an iPad app. The entire cabinet has access to both (PEMANDU supplies each minister with an iPad if they do not have one). Idris Jala, and on

[47] These salaries are on a different scale to those of civil servants, as PEMANDU staff are formally hired as consultants.

[48] This is quite similar to processes of enculturation at the Defense Advanced Research Projects Agency (DARPA), in the United States. See Fuchs (2010).

occasion the responsible ministers, will then comment on the updates and prioritize issues for the coming week.

Next to the weekly reports, meetings of **technical working groups** form the next most frequent process. The technical teams are drawn from the participating ministries and private sector firms, headed not by PEMANDU but by the EPP "owner(s)," i.e., the lead organization. Meetings typically are biweekly, but the working groups in particularly large or troubled projects can meet every week. The degree of PEMANDU handholding is proportional to the difficulty of the project and the novelty of the process to the "owner". Where the owners are familiar with the routines, PEMANDU involvement can be slight. In the Kuala Lumpur "river clean-up" project, one of the working groups was led by officials from the planning department and city hall, both of whom were well-versed in the process.

FIGURE 2: Process Rhythm within PEMANDU

Frequency	Action	Format	
Annually	Annual report	Report published; televised address by PM	
Once- to twice per year	"Putrajaya Inquisition"	Meeting chaired by PM to clear any issues not solved in lower meetings	↑ Penalty default
Semi-annually	PM's performance review	Closed-door meeting: only PM, Minister, and PEMANDU CEO	↑ Penalty default
Monthly to quarterly	Steering committee meeting	(Co-)Chaired by Ministers, with senior officials from all agencies: principal decision making forum	↑ Bump up
Weekly to fortnightly	Meeting of technical working group	Problem solving with relevant managers: principal working session	↑ Bump up
Weekly	Progress report	Emailed, uploaded, and available on iPads	↑ Bump up

The next level up is **the steering committee** (one for each NKEA and also known as the "delivery management committee")**.** Typically chaired by one or two ministers, these committees comprise secretary-generals, director-generals and CEOs from principal ministries or agencies and their deputies and under-secretaries. Senior leaders from private sector organizations are co-opted into these meetings as needed. For example, the committee for the Palm Oil & Rubber NKEA is chaired by the Minister for Plantation Industries and Commodities (occasionally, co-chaired with minister of rural development and Idris Jala himself) and consists of the ministry's secretary-general, deputy secretary-generals, under-secretaries, director-generals and their senior directors from Malaysia Palm Oil Board and Malaysia Rubber Board, as well as secretaries and CEOs of central and state implementation agencies.

The steering committee's discussion is focused by PEMANDU's tracking report, distributed in advance, as well as by reports on individual projects by their "owners". The PEMANDU team is accountable for members having as much information as possible, and can facilitate the meetings themselves. As with the technical groups, the weight of PEMANDU's role varies with the experience of the participants. At the most, it may unobtrusively guide the meetings; at the least, it

ensures that the meetings happen (by escalating the issue if they do not) and that the agenda includes critical problems or decisions.

The frequency of these meetings is calibrated to need. For the cruise terminal EPP in the tourism NKEA, there have been two steering committees in six months, as most issues have been dealt with successfully at the working level. For the MRT in Kuala Lumpur, there is an MRT Weekly Project Meeting to track implementation progress, bumping up to a quarterly MRT Technical Committee Meeting led by the Land Public Transport Commission of Malaysia. Ultimately, the project reports to the MRT Exco, a high level committee involving senior government officials, chaired by the Chief Secretary to the Government, which also meets every quarter.

An overall review of the ETP and GTP takes place twice a year. At the half-year mark PEMANDU compiles and releases a public mid-term review. This provides an update on the progress of all the NKRAs and NKEAs, and progress against targets for both the aggregate goals and the specific EPPs.

Alongside this public release are two private processes. One occurs during the mid-year budget review for all of government. The EPPs influence the capital budget allocated to ministries, and the PEMANDU directors have a sense of which projects are delayed or less costly than anticipated, or vice versa. Hence together with the Economic Planning Unit (EPU) and the Ministry of Finance, they are often able to broker a reallocation of budget between different departments.

A more formal process takes place at the most senior levels. Twice a year the Prime Minister conducts a performance review of each of the cabinet ministers. This is a closed-door meeting; besides the PM and the minister, only Idris Jala is present. The basis of the meeting is a memo, prepared by PEMANDU (as secretariat for the process). As might be expected, this input is principally in the form of a list of the KPIs and their current status, together with qualitative information about the status of the programs. The purpose of the meeting is to discuss areas of slippage and to agree on actions to remedy them.

This is, though, not the only means of invoking the Prime Minister. If an important KPI is consistently missed, and if the problem is traceable to a single issue requiring ministerial-approval, then PEMANDU has the ability to call a meeting between the relevant ministers and the PM. This is informally known as the "Putrajaya Inquisition".[49] In practice, several such issues will be tabled at one "Inquisition".

It is perhaps notable how rare these meetings are. In 2013 one occurred. The first draft of the agenda had eighteen issues to be discussed; however, this was reduced to six (including three recurring ones) just before the day of the meeting, as the result of last-minute settlements between Ministries. That is, across 25 programs, the PM's intervention was invoked on a mere six issues per year. Yet the intervention reliably takes place. It is the credible threat of this meeting that, rarely invoked in practice, provides the crucial element in PEMANDU's ability to solve coordination failures.

C. Bumping Up Coordination Failures

By necessity, a large number of tasks in industrial policy, as with public sector management in general, require agreement and joint action across departments. A simple example, from routine public management, is the installation of closed-circuit television (CCTV) cameras to improve law enforcement. The police must be consulted for the specification of the cameras; the local district will buy and plan for the installation; they will need approval from the lamppost owner (in this case the power supply company); and so forth. Similar problems arise whether the project is

[49] Putrajaya is the area outside Kuala Lumpur where Malaysia's federal Ministries and the Prime Minister's office are located.

facilitating the entry of a new factory, the construction of cruise terminals, or the initiation of a new research program.

On one view such problems are evidence of the hopeless bureaucracy of public life, resulting from pathologies of turf-protection and self-dealing or shirking. The remedial strategy is then the frequent deployment of authority to enforce solutions, linked to close monitoring to ensure they are carried out (with a further invocation of authority if they are not).[50]

This strategy may cause as many problems as it solves. The imposed solutions risk being sub-optimal, since the decision maker is by definition none of the contending departments and thus has less information about their domain than each. Moreover, since divisions of responsibility in most cases are not flights of fancy but have followed some institutional logic, of efficiency or accountability or both, the strategy risks escalating the conflict to a deeper principle than the practical problem at stake. So, for example, the question of wiring may be escalated to a political clash over district self-governance. Further, since several of the parties will not have given their consent to the decision, they can be expected at best to drag their feet and at worst to attempt to reverse or subvert it. Finally, given the frequency of such coordination issues, they may come to monopolize the scarce time of senior leadership, crowding out more strategic issues.

An alternate, "managerialist" view is that most of the disputes are due to misunderstandings linked to a lack of fixed deadlines and urgency. Turf and self-dealing play a role, but they are also bound up with legitimate differences of opinion—sometimes a result of miscommunication—that lack effective channels for resolution. It is difficult for an outsider to know which of these factors predominates, and in general even the agents themselves might confuse them. In the absence of tools to resolve differences, and of a credible means to enforce their use, the problems remain unsolved.

The strategy that results from this diagnosis is to institutionalize an information exchange regime that addresses two underlying problems: the hoarding of information, and obstinacy in the face of good arguments. The flow of information created by this regime allows the parties to continuously assess and reassess each other's intentions and capacities. In cases of successful collaboration, this slowly leads to the development of mutual reliance and trust.[51]

The specific institutional keys to such a regime are what we will call a "bump-up" mechanism that penalizes information hoarding and obstinacy, and a "penalty default," as an ultimate recourse against deadlock (see Figure 2 above).

The "bump up" mechanism specifies that decisions at any one level require consensus (in effect the absence of persistent, vehement disagreement); and that failure to reach such consensus leads, without fail, to the issue being referred one level up. This has two effects. First, since agreement at any one level of collaboration is by consensus, it is easy to demand more information simply by refusing to join the majority. But second, in case of deadlock, self-serving, or narrow-minded obstinacy will be revealed in a professionally damaging, even humiliating way.

Both features are necessary. If lower-level decisions are routinely referred upwards, those at working-level will lose the incentive to collaborate, since they must still seek further approval, and gain an incentive to hoard information, since doing so may prove valuable in an appeal. If lower-level disputes are not referred upwards, there is no or little penalty for obstinacy, and forming consensus will become arduous.

[50] Perhaps the paradigmatic case of this approach (at least as it is conventionally portrayed) is the Economic Development Board in Singapore.

[51] The literature on the evolution of cooperation and trust is vast, with Axelrod (1985) the seminal theoretical treatment, as well as range of case studies of its development in firms (e.g., Sabel, 1993) and the impact on the management of firms (e.g., Bloom, Sadun & Van Reenen, 2012) and economic development (Zak & Knack, 2001).

The “penalty default” involves the bump up of decisions to the highest, ultimate authority in case of an intractable stalemate. The mere threat of high level intervention is likely to have a deterrent effect, as it is tantamount to public admission of an inability to solve problems among responsible peers. But even more important, as the highest authority will be unaware of the particulars of the dispute, any decision will be worse than what could have been achieved by collaboration, and will deprive the participants of further control over their joint fate. The expectation is that the threat of this penalty default, linked to credible means of prior resolution, prompts the clarification of terms and the urgency necessary to resolve the dispute.

In sum, in this second strategy, an outsider does *not* take the decision, unless after some specified time the disputants deadlock and are unable to solve the problem themselves. The risk with it is that either the threat is not credible or that the tools provided are not good enough, and the system lapses back into paralysis.

Though PEMANDU may have been presented at times as following the first strategy, reliant on the continual intervention of authority, so far as we have observed it in fact follows the second. Or, put differently, the unit’s mandate is to make the second strategy work within government by providing tools for problem solving and making the prospect of ultimate intervention credible, and hence scarce.

Its chain of meetings, driven by the monitoring of KPIs, creates the “bump up” mechanism. If a KPI is not moving, the first question is “why?” If the answer to this is a cross-department disagreement, then the PEMANDU team will place the issue before the working group. If it is not solved, then the issue will be tabled at the next technical committee. If it is still not resolved, it escalates to the steering committee. If, finally, it is still not solved, then the meeting with the Prime Minister is called. The continuous pressure of the KPIs ensures that this process does not halt just when the issue seems to be resolved in the meeting, but only when the resolution takes effect in practice (i.e., when the indicator starts moving towards green again).

The sequence leverages internal, pre-existing cultures to generate the pressure to solve issues. A member of a lower committee, for example, will have his or her superior sitting on the higher committee. If they do not solve the issue themselves, they will have to appear before their superior and their superior’s peers to explain why. If it becomes apparent that the issue was merely obstinacy or shirking, then the reputation of the more junior official will be diminished in front of superiors in the department and a highly influential group of senior officials across departments.

There are two entwined conditions for this to work. One is that a reputation for obstinacy or shirking carries material or normative penalties for civil servants (e.g., by reducing promotion prospects or identity-derived utility). This may not hold in all civil services, but it appears to be the case in Malaysia’s.

The second is that capabilities are provided alongside the incentives created by the bump up and penalty default. If they are not, demoralization and governance failures could result at lower levels; and senior committees could be inundated with trivial issues, so that principals delegated attendance and the penalty for escalation diminished. This likely creates some path dependency, with the first few meetings of the technical working groups and the steering committees setting off either a virtuous or a vicious cycle.

These capabilities are not trivial. It is often difficult to identify the root cause of a co-ordination issue in complex public systems: Is the problem simply one of different operational rhythms or processes? If so, can one department be persuaded to align to the other? Is the problem one of insufficient budgets in one department? If so, can transfers be arranged? Is it the result of a solution in one domain (e.g., the electrical circuits) being a problem in another (e.g., the routing of telecom cables)? If so, is a second-best solution that causes fewer indirect problems available? If not, is it just a question of competing priorities, or does a more fundamental policy decision need to be taken? In sum, is the problem one of operational procedures, one of competing priorities or trade-offs, or one of larger policies clashing? Or, perhaps, even more fundamentally, is the problem one of deep misunderstanding, of critical words meaning different things to different people, and hence prohibiting agreement?

This type of questioning is similar to the methods for simultaneous engineering and error detection through interrogation that are central to flexible, lean and innovative production in the private sector.[52] It is a measure of how difficult they can be that it took some of the world's most sophisticated companies a decade (or more) to master them.[53] In no sense are they "common sense," available to all persons of good will.

This then is PEMANDU's role. It facilitates connections and discussions among departments to answer questions such as the above and seek to ensure they are dealt with before senior meetings took place. Over time, such capabilities have spread, and a range of interviewees reported that they were now comfortable dealing with these issues themselves. Even in such cases, though, PEMANDU remains to monitor that the meetings take place regularly and the capabilities are put to use.

D. The "70/30" Rule: Revision and Its Limits

Whether in the process of ordinary work, or in bumping up itself, some problems will reveal that the initial plans require revision, or—ranging further still—that important possibilities were entirely overlooked. In the linear understanding of "delivery" such revision should be limited, as it could easily serve as a pretext for covering up non-delivery or disorienting agents ("moving the goalposts").

In PEMANDU, by contrast, revision is a frequent, almost pervasive occurrence. Idris Jala's rule of thumb is that of the initial plans only around 30% are implemented exactly as they emerge from the Labs, with the remaining 70% subject to revision as implementation proceeds. This does not mean that only 30% of the initial plans are useful. On the contrary, the revisions that take place—at least the "routine" ones—require an agreed upon and well-known starting point in order to maintain both integrity and effectiveness.

In practice, revision occurs in a tiered process that intersects with the councils used for "bumping up". The simplest changes are tactical and operational modifications of specific actions required to implement the entry point projects. Slightly more difficult are wholesale revisions to the plans for a specific project, and much more difficult are the addition and removal of projects. At the upper end are changes to an entire NKEA (or NKRA), with the most difficult—but still feasible—revision being to the KPIs governing a program. Since a different process governs each of these revisions, and those processes are at the core of PEMANDU's flexibility, we will describe each of them in turn.

The most straightforward is the tactical revision of project plans. The working groups are empowered to do this, so long as they have a consensus, can explicate a rationale to the monitoring team and can defend the decision in a higher-level committee. Changes that have budget implications require sign-off in the steering committee, and, where ordinarily required, standard policy procedures still have to be followed.

An illuminating example recently occurred in the palm oil NKEA. One of its central projects is the organization of cooperatives among palm smallholders. As is described further in Section 4(c), the immediate purpose of these cooperatives is to increase smallholder income by cutting out middlemen to sell directly to the mills. As of end-2013, 30 such cooperatives have been established, covering 228,742 hectares.

After the first wave was established, however, the monitoring team noticed that tonnage flowing through them was dropping sharply, from 900 to 200 tons per month. Investigations in the field

[52] The literature on this type of production, beginning with the paradigmatic case of Toyota, is likewise vast. See, for example, MacDuffie (1997), or the still classic treatment in Womack, Jones, & Roos (1990).
[53] Helper & Henderson (2014) demonstrate how General Motors struggled to adopt these techniques through to its bankruptcy in 2009, despite seeing them close-hand as early as the mid-1980s.

fed into working group discussions that diagnosed the problem as cooperative cash flow. Mills typically settle accounts two to three weeks after taking delivery, but smallholders—especially if lower-income—often need (or value highly) cash on delivery. The middlemen used working capital to fund the time difference, but the cooperatives had neither access to credit nor substantial cash reserves and hence could not compete.

The working group decided on a relatively lean solution. Rather than providing the cooperatives with an infusion of cash, it proposed to authorize them to run overdrafts with local banks of up to RM 200,000.[54] To enable their access to credit, it also proposed to set aside a small credit guarantee fund. This would require RM 6 million, which could be funded from accrued interest on yet-to-be disbursed funds allocated to the agencies in the palm oil program, and hence it would not require additional budget allocation.[55] The proposal from the working group was made to the steering committee in April 2014, and as of writing the program's implementation has begun. Whether it will work remains an open question, but if it does not the continued monitoring of monthly tonnage will force another round of such revision. Moreover, the example illustrates in miniature the value of recursion, given how issues of access to credit have often hamstrung agricultural cooperatives elsewhere, and how a "linear" approach might have struggled to deal with the problem.

A more difficult revision is the addition or removal of a project as a whole. Both decisions carry substantial consequences: including a project in the ETP leads to allocations of financial and human resources; removing one both subtracts such resources and may carry reputational effects.

As a result, adding a project requires at the least the endorsement of the relevant steering committee and, in some cases, the approval of the Prime Minister himself. It also requires the approval of relevant authorities in the civil service, both within departments and with budgetary authorities such as the Economic Planning Unit (EPU). The number of actors that have to join the consensus in favor of the addition imposes a substantial barrier, weighting errors in approving projects towards those of omission rather than commission.[56]

On occasion the possibility of such a revision can be built in from the beginning; otherwise, it can be prompted by the discipline of the KPIs. That is, if it becomes visibly apparent that an NKEA or an NKRA will not achieve its long-range targets, but all the current projects are on track, then informal pressure can create a search for new projects to make up the difference. This search may be led either by PEMANDU or the lead department itself, leveraging the former's routine problem solving and information sharing tools.

The river clean-up EPP within the Greater Kuala Lumpur (GKL) NKEA provides an example of the process in action. The EPP's long-term target is for the Klang river to become 'Class IIb', from fluctuating between Class III and Class IV in 2010.[57] In the GKL Lab, twelve initiatives were selected, but several participants doubted that these would be sufficient. As a compromise, the Lab decided to begin the first initiatives while launching a feasibility study of other possibilities in parallel (this overseen by the Department of Irrigation and Drainage, DoID). The latter reported back in 2012, confirming that the existing initiatives would be insufficient. Grouped together as "River Cleaning Phase 2", the study group recommended the addition of five initiatives, ranging from an "interceptor" pipe encircling the city and a "collapsible weir" to continuous treatment of effluent from markets and food courts. The total cost was estimated at RM 430 million.

[54] Roughly US$ 60,000. The figure was arrived at by calculating the required working capital to make up-front payments to small-holders while awaiting payment from the mill.

[55] Under Malaysia's budget framework, departments have first right over such accrued funds, i.e., may use them without requesting a formal budget approval.

[56] On the relation between levels of consensus and resulting biases towards different types of error, see the series of papers initiated by Sah & Stiglitz (1986).

[57] These categories are as defined by United Nations Environment Program, originally based on the National Water Council (UK) scheme. A "class III" or "class IV" river is either suspected of being or is known to be actively harmful or toxic to fish life. A "class II" river contains discharges but is considered habitable for fish.

The package on its own would qualify as a large EPP. The recommendation to pursue it was first tabled in the GKL Steering Committee, chaired by the Minister of Federal Territories (which is responsible for the administration of KL). The Committee, while accepting the recommendation in principle, decided that given the size of the request the Prime Minister's approval was necessary. At the same time, DoID and PEMANDU began consultations with the EPU and MoF regarding the feasibility of funding the initiative. Over several months a consensus was built, leading to a group meeting with the PM where the initiative was authorized. It has subsequently been incorporated in the expenditure framework and PEMANDU's monitoring. As of this writing, some 53 percent of cleaning and 14 percent of beautification works have been completed.[58]

Ascending another degree, a different process occurs when it becomes apparent that tweaking, adding or removing projects will not be sufficient to bring an NKEA or NKRA back on track, or if the passage of time means that prior plans need to be revised in light of changed global or national circumstance. At first, this wholesale revision of an NKEA or NKRA was exceptionally rare, but it is becoming increasingly common as the original plans approach the five-year mark.

E. Mini Labs and the Revision of KPIs

The principal tool for doing this is to conduct a new Lab, either in full or as a mini-version. Such "mini-Labs" take one to two weeks, with a smaller set of stakeholders than a full Lab, facilitated by the relevant PEMANDU team. A full Lab is conducted if the plan as a whole has been overtaken by events, or if the landscape of stakeholders has shifted, whereas a "mini-Lab" may be used for a "tune up" to adjust plans seen as generally still intact.

In either case, there is no formal process to authorize the Lab, but in practice approval is sought from the Steering Committee (SC). This is only natural since, especially for a full Lab, substantial time commitments will be required from the agencies represented on the SC, and since the proposals from the Lab will require SC debate and ratification. As with the original Labs, the EPU and the MoF are called in for a mid-point "stress test", and their approval is required for any additions or revisions to budgets.

The NKEA that has run the most Labs is Electronics & Electrical (E&E). The original, run in 2010, was by most accounts unsuccessful. Some stakeholders, wary of the process, attended but did not fully participate; others, by the nature of their position in the value chain, had limited perspectives on the shifts underway in the industry, either in products or processes; and the sector itself is perhaps the most difficult in the ETP. (Almost alone among the NKEAs, E&E had to "stop a freefall" before "starting to climb"). The consultants facilitating the Lab exacerbated the difficulties by concentrating on the incumbent MNCs, as opposed to the more dynamic, small and domestic firms. In the industry as a whole, the smartphone and tablet revolution was accelerating, and the original Lab soon came to seem outdated.[59]

A full rerun ("E&E 2.0") was thus conducted in the first half of 2012, resulting in a large number of EPPs (20, compared to nine in palm oil or 13 in oil and gas). The second Lab aimed to address the gaps from the first, while taking advantage of an altered stakeholder landscape and greater internal experience in running Labs. The EPPs are mostly on track, but as will be discussed in Section 4(c) below, they may not be an entirely appropriate responses to either the challenges or the potential of the sector, which may result in the need for a third Lab.

Finally, the most difficult and tightly governed of the routine revision processes is to the KPIs themselves. This is possible only during the semi-annual review process. A Minister seeking such a change must submit a request a month in advance of the review. The respective PEMANDU

[58] http://www.nst.com.my/node/59484

[59] This reflects the vulnerability of the Labs described above, namely the reliance on the knowledge of the actors in the room (only partially mitigated by consultants). On the other hand, it is not clear whether any alternate model could have made a difference. After all, some of the hitherto most successful and sophisticated companies in the world entirely missed the shifts underway.

teams review this before submitting the recommendation, if they agree to it, to PEMANDU's Minister Key Result Area (MKRA) Team. That team makes a final review and recommendation to the CEO. The final decision is then made by the Prime Minister, who communicates it directly to the requestor during the review.

The process is highly confidential but we were able to observe some of the requests and responses. Two aspects were clear even from a cursory glance. First, rejections far outweigh approvals, but the latter do occur. That is, it is improbable but not impossible to change a KPI.

Second, reasons that resemble the complaint that "somebody else was supposed to do ABC, but he failed to do so, and so I cannot achieve XYZ, which is my KPI" are summarily rejected. In other words, coordination issues are cannot be used as a reason for changing a KPI target and, by that means, switching a signal from red to green. This technique guards against the subversion of discipline. However, it does not imply that such issues are not taken into account in the performance reviews themselves. To dismiss such issues out of hand might diminish credibility or invite a backlash.

More generally, striking a balance between discipline and pragmatism in the pursuit of existing goals is among the core challenges of the recursive approach. It can be tackled only in the details of institutions and processes. Those of PEMANDU and the NTP are summarized in Figure 3.

FIGURE 3: Revision Processes in the NTP

Revision type	Steps	Discipline
Modification to project plans	• Working group consensus • May/may not seek SC approval • Follows standard processes if involves budget or policy change	• KPI monitoring (both discipline and spur) • Standard governance procedures
Addition or removal of individual projects	• Working group conducts in-depth study, comes to consensus • SC approval must be sought • Standard budget processes must be followed thereafter	• Steering Committee consensus • Budgetary authorities • PM approval, if project is substantial
Wholesale revision of an NKEA/NKRA	• NKEA owners/PEMANDU decide current program inadequate • SC approval to hold Lab or mini-Lab and for its results	• SC consensus required • Same hurdles as for any "Lab" outcomes (budget approvals, etc)
KPI modification	• Minister completes KPI request form during semi-annual review • Request reviewed by PEMANDU, final decision from PM alone	• Multiple veto points for turning down request • Disallowed reasons for requesting change
New program-level goals	• Prompt by newly discovered firm, chance encounter, study group, etc • Form consensus *outside* of any formal supports	• All of the above

Spurred by KPI monitoring

F. Discovering Over-Looked Possibilities

On occasion, some important changes in goal setting derive not from the failure to meet a KPI, but rather from the discovery of over-looked possibilities—goals that even the best informed actors in the Labs failed to foresee. The fact that these goals were unforeseen in initial planning does not necessarily mean the institutional mechanisms created by the ETP and PEMANDU do not significantly promote their articulation and realization.

Such possibilities can enter on a small scale (e.g., evolving from a single partner or firm) or on a larger scale (as an entirely new sector). A striking example of the former is a young, rapidly growing firm making orthopedic implants. This is an industry with extremely rigorous quality demands and whose structure is changing rapidly. As in electronics (among others), traditional contract manufacturing in such medical products is fading, being replaced by sophisticated forms of co-development and regional specialization. The firm in question has both realized this and is a pioneer of the new practices, with short learning and development cycles networked to a sophisticated machining center.[60]

The firm is thus emblematic of the 'new model contract manufacturing' sought in E&E, and more generally of the new capacities discussed in Section 4(c) below. PEMANDU sees it as such, and its founder was quite clear that the ETP has been instrumental in accelerating his growth. But, strikingly, the firm was not part of any initial Lab, or indeed part of any other government program. The founder had in the past sworn to deal with government as little as possible, avoiding incentive programs to steer clear of bureaucracy. He had come to PEMANDU's attention via the information networks that the firm's staff had built in the private sector; PEMANDU then convinced him to participate in the ETP by brokering a partnership between him and another firm, and by facilitating his application to a grant program that he used to upgrade and expand more quickly than otherwise. His experience is now informing both the development of the "new contract manufacturing" EPP and the redesign of some public support programs. This case involves just a single firm, yet, without space for the unforeseen neither it nor the model of the future that it helps concretize would have come to PEMANDU's notice or become part of the ETP.

An example of a larger cluster of such unforeseen goals is the creation of a national biomass strategy. That strategy has estimated that biomass might generate up to RM 50 billion in GNI by 2020, an amount roughly the same size as the electronics sector.[61] Despite this magnitude, since the sector had almost no prior presence in Malaysia, it was overlooked in the initial ETP framing and did not arise in the sector-specific Labs (including that of palm oil, which will generate the largest amount of biomass).

Rather, a serendipitous chain of circumstances brought it to the attention of senior officials at Malaysia's innovation agency (Agensi Inovasi Malaysia, or AIM), which was established in 2010 and operates on cognate principles to PEMANDU.[62] AIM convened a series of working groups to discuss the sector's potential, then secured approval from its governing council to conduct an in-depth study. That study, adopted as a national strategy, has led to a set of initiatives that employ mechanisms similar to those of the conventional ETP: KPIs have been set, working groups and technical committees have been established (with PEMANDU involved in both), and a rhythm of reporting and decision-making have been established.[63]

This last example then both encapsulates and foreshadows some of the themes that run throughout this study: the limitations of the Labs; the importance of continuing and recursive processes in catching new possibilities; the openness of the program to wholesale, yet disciplined, forms of revision; the way that such capacities are diffusing among agencies beyond PEMANDU; and how this diffusion is allowing agencies to leverage each other's capabilities in new ways.

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[60] Specifically, the strategy is to allow the leading developed world firms to manage the substantial risks of navigating an increasingly difficult regulatory environment, and to rapidly pass along new products to its Malaysian partner, which can then manufacture them for "one step behind" Asian markets.

[61] http://www.innovation.my/pdf/1mbas/Biomass%20Strategy2013.pdf (accessed June 1, 2014).

[62] AIM and PEMANDU have substantial formal and informal links, with Idris Jala sitting on AIM's governance council and officials from PEMANDU regularly participating in AIM's working groups and councils. AIM has roughly as many staff as PEMANDU (approximately 100 staff), drawn from a similar mix of backgrounds.

[63] A similar process and model is underway for another "blue sky" sector, graphene (more precisely, its applications). For both, the one process element that has been left out is to hold a Lab.

IV. THREE DOMAINS OF PROBLEM SOLVING

A. The Unconventional Demands of Conventional Policy Changes and Programs

PEMANDU's strengths and limitations, and the capacities of other agencies, public and private, that enhance (or restrict) problem solving are in evidence in the three domains of problem solving described in the introduction: conventional policy changes and programs; large, complex projects; and deeper reform to induce new capacities. The formal categories of NTP initiatives—the SRIs, EPPs, and NKRAs—cut across these three domains. To clarify the relationship between them and the domains of problem solving, Table 1 maps to both the initiatives discussed in this study, with the preponderance of NKEA EPPs reflects our special concern for "new industrial policy". The extent of PEMANDU's involvement, and the effectiveness thereof, vary across the table: in general it has been less involved at the top left, less effective at the bottom right, and most effective in the center.

TABLE 1: Relationship of Problem Solving Domains and NTP Classifications (programs and projects cited in the study)

	NKEA SRIs	NKEA EPPs	GTP NKRAs
Conventional policy changes and programs	• Goods and services tax (GST) • Business regulations • Minimum wage	• Change in tax treatment of enhanced oil recovery • Market access for pharma in Indonesia • Certification processes for aircraft MRO	• Special needs schools • "Hot spot" deployment[64] • "Black spot" program
Large investment projects	• N/A	• Mass rapid transit (MRT), Greater KL NKEA • Pengerang Oil & Gas Terminal • GKL "River of Life" • Iskandar education export zone • Malacca cruise terminal	• Urban Public Transport in GKL
Inducing new capacities	• Public service delivery	• Rice paddy cooperatives • Palm oil cooperatives • Retail store upgrading • Oil & gas capital goods • Electronics • Dairy program	• Education reform • Police reform • Auditor General's office (corruption)

Introducing tax incentives, a conventional policy problem, exemplifies the issues at stake in the first domain. Given the steady depletion of existing reserves of oil, the Lab generated two proposals (EPP 1 and 2) to enable enhanced oil recovery (including from marginal fields), in part by altering the tax treatment of revenues under "risk service contracts" (RSCs). To implement this required a range of technical agreements, from the specification of marginal fields to the setting of the precise rate. Several disputes arose, as the government sought to ensure it was not giving away too much and the industry sought viable returns. The conventional solution would have been lobbying and horse-trading. PEMANDU's machinery accelerated the resolution of these disputes and made the issues and outcome more transparent by continual reporting on its status, bumping up each dispute as it arose, and playing an intermediary role in facilitating agreements.

In most sectors we found similar examples, though often at a smaller scale. In healthcare, changes in Indonesian regulations locked Malaysian producers out of the market, until persistent failure to meet the export KPI bumped up the problem and induced a diplomatic effort to resolve it. In

[64] The table maps the problems as they are being tackled, not necessarily how they would be in an ideal situation. That is, these should be third domain problems, but are being treated as first domain. For the controversies on these type of police reforms, see generally Bragha & Weisberg, the New World of Police Accountability.

business services, a change in certification processes was needed to obtain sufficient skilled labor for aircraft maintenance and repair, but it was only when delays in realizing an Airbus investment surfaced the problem that the PEMANDU team brokered an agreement for the necessary revision. In such cases the inclusion of an individual project or firm in the ETP, only for it to be blocked by a regulatory constraint at once specific to the sector but common to most or all of the firms in it, led to reforms of broad applicability. Where this is effective, the KPIs and PEMANDU's machinery provide a means of identifying and remedying constraints that is more grounded than the more traditional means of "public private dialogue", or, more simply, lobbying.

In other instances, the role of PEMANDU itself is more limited, although its monitoring can be useful in maintaining pressure. This is particularly the case where the policy change first requires a contentious political decision, or its implementation can be handled within a single Ministry or agency. An example of both is the introduction of a goods and services tax (GST).

A reform in which PEMANDU was more involved, but still far from central, came in the enactment and implementation of a minimum wage. The decision to enact such a wage was out of the unit's hands. The subsequent negotiations between business and labour over the wage's level and the timing of its introduction were contentious, and were not facilitated directly by PEMANDU. However, the unit did use its monitoring tools and brokering experience to maintain pressure for a solution, and to avoid the contention becoming an excuse for the breakdown of the reform.

In business regulation, an arena of many small regulations, PEMANDU has also been less central, albeit because of the strength of PEMUDAH (see Section 2). In many ways, the capabilities of PEMUDAH prefigure those of PEMANDU, and it is the former that has been primarily responsible for Malaysia's rise in *de jure* rankings, such as the World Bank's *Doing Business*.

As well as not being central to some reforms, PEMANDU, and more broadly the NTP, has also made mistakes, of two types: succeeding in implementing questionable reforms or programs; and simply failing to implement. Some examples of the first were discussed above. An example of the second came in reforms to labor dispute regulations,[65] where PEMANDU attempted to broker agreements without fully understanding the issue, and without the penalty default being operative for any of the participants (unions and business). The result was a backlash; and the reform subsequently foundered.

A final sub-class, one in which by contrast PEMANDU has been more successful, blurs the boundaries of this and the subsequent domain. This is the class of "linear" programs. These are akin to traditional forms of innovation funding or industrial policy, where some form of public support for a specific activity is decided upon, after which cases must be reviewed and the support extended. In these, coordination problems can arise in, first, deciding the technical details of the support and eligible activities, and then the assessment committees must run on time and come to decisions. In these cases the work of actual problem solving is mostly done up-front, followed by relatively simple monitoring and process management.

Examples here would include the palm oil replanting program, where a subsidy is being extended to smallholders to underwrite their replacement of old palm with new, higher-yielding varieties; or the facilitation of aquaculture investments, where stringent criteria were agreed upon for joint-ventures with foreign firms that could then access capital subsidies. In both, the responsible agencies—the Ministry of Agriculture (MoA) and MPOB respectively—have led implementation, with PEMANDU facilitating the initial design and requests for funding and monitoring ongoing implementation.

[65] For example, by imposing a time limit for dispute resolution. The team believed this to be "win-win", but since employers had previously been most responsible for dragging out disputes, delays were informally to their benefit, though they sometimes stated otherwise in public fora.

B. Large Investment Projects

It is perhaps in the arena of large projects that the transformation program and PEMANDU have, for now, most come into their own. Such projects involve capital investments from several hundred million to several billion dollars. By their size they involve a range of departments, from those provisioning services in their vicinity to agencies responsible for regulating their impact. They are also sensitive to flaws in their underlying assumptions, putting a premium on operationally demanding flexibility, and liable to a range of unforeseen complications. Most (globally) are delivered over-schedule and over-budget.[66] Many combine the coordination of public and private interventions characteristic of new industrial policy, whether or not they are mostly or strictly "public" in their funding or execution.

These characteristics play directly to the strengths of the processes described above. With the delivery of the project on schedule as the overall KPI, broken down into intermediate milestones, each new problem of coordination or regulatory oversight (foreseen or not) enters into the bump-up process until a solution is found or the revision processes are triggered. While this naturally cannot be foolproof, across the portfolio of such projects in the ETP there are strong indications that the program and PEMANDU have made a material difference to the capacity to deliver.

The clearest such example is the largest: the mass rapid transit (MRT) system in Kuala Lumpur. As with any such system, its design and construction have created a continual series of issues to solve, involving multiple states, regulatory bodies, and complex financial and technical decisions (from funding model to tariffs). First proposed in early 2010, and included as an EPP in the final ETP, the MRT was one of the highest priorities in the first stages of the program. The timetable set was ambitious: from approval in principle in 2010 to operation of the 51km Line 1 by 2017, at a total investment of RM 23 billion, or roughly US$7 billion.

For its first year almost weekly SC meetings, which included the opposition government of a state neighboring central KL, tabled and resolved issues from the route alignment to the financial model.[67] The first KPI was approval of the Final Implementation Plan by December 2010; the next was for construction to begin by mid-2011; and now the KPIs track the progress of excavation and the arrival of key machinery. The first two dates were met, and the project remains on track. By the end of 2013, seven of ten tunnel boring machines were at work, excavation of the seven underground stations was more than half complete, and approximately RM 4 billion, or US$1 billion, had been disbursed.

As a comparison, in Singapore a new MRT line was announced in early 2008, of 30km, i.e., two years earlier than the KL MRT Line 1 and 20km shorter. It began construction in early 2014, over a year later than KL, and the date of opening has already been delayed by a year, from 2018 to 2019.[68] In Kuala Lumpur itself, the immediately prior investment was a short (8.6 km) monorail, at a cost of merely MYR 1.2 billion. The project was initiated in the mid-1990s, but despite its smaller size only started operation in 2003,[69] and was plagued by overruns, controversy over its contracting and eventually bankruptcy.

A similarly demanding project was the Pengerang Integrated Petroleum Complex, or PIPC. This project, originating with one of Malaysia's largest oil & gas engineering and services companies

[66] Flyvvbjerg (2007) describes the pervasiveness of overruns in large infrastructure projects, and De Neufville & Scholtes (2011) present both an analysis of the assymetries in most planning assumptions as well as engineering methods to build in the flexibility needed to mitigate the resulting risks.

[67] This should not be taken to imply that PEMANDU itself was involved in devising that financial model. Moreover, whether or not that model makes the MRT a "PPP" is beyond the scope of this study, which is concerned primarily with its implementation, not its funding stream or moniker.

[68] A similar comparison could be made to a range of projects elsewhere, from Sao Paulo's metro (part funded by the World Bank) to Stockholm's City Line. Exceptions might be found in some subway lines in several cities in China, but those occur in a vastly different political environment.

[69] Work on the line was interrupted by the Asian Financial Crisis in 1997, but this accounted for only the cessation between December 1997 and July 1998.

(Dialog), aims to build a regional hub for trading just across from Singapore. It takes advantage of growing trade in the region, and the unavailability of land in Singapore, hitherto the dominant hub in the region. The long-term plan, reminiscent of a "growth pole",[70] is to use initial, catalytic investments in storage terminals and sophisticated logistics to crowd in high value-added activities in trading as well as larger investments in refining and petrochemicals.

The first investment, by Dialog itself, amounts to RM 5 billion (over US$ 1.5 billion) in a storage and logistics facility on reclaimed land near Johor. The area is home to several fishing villages, requiring extensive safeguards measures for resettlement and ecological disruption. Likewise, the need to rapidly import and re-export oil, with its own special tax regime in Malaysia, required complex regulatory negotiations, as did proposals for initial tax concessions on trading activities. Such complexity and scale led some observers, including (it is said) senior officials in Singapore, to state at conferences that "Malaysia will never pull it off". Nevertheless the project, initiated in 2010, began operations on schedule in April 2014.

Throughout, the bump-up and revision mechanisms served to keep the project on track. When a dispute arose over compensation to some of the resettled fishermen, a repeated series of meetings were brokered that resulted in an increase in the amount paid, co-funded by the private sector and government.[71] Similar compromises and coordinated solutions were brokered as suitable land had to be found for resettlement, as the reclamation plan had to be altered to allow a channel to preserve currents, and as the tax rates and customs procedures had to be specified.

These disputes were not solved top-down. The founder of Dialog himself contrasted the PEMANDU process to the Economic Development Board (EDB) in Singapore, stating that the former relied on consensus and compromise and the latter on authority. Though, he said, he had sometimes wished for the latter, he allowed that in Malaysia's context the former was more desirable.

Indeed, this comment does point to one limitation of this model: it cannot overcome obdurate resistance, whether in good faith or not, when its source is not amenable to the bump-up or penalty default. An example is the "Health Metropolis" EPP under healthcare, a plan for a large-scale, world-class complex of healthcare facilities in Kuala Lumpur. It has foundered on the resolute opposition of local neighborhood groups, who fear the impact on traffic, affordability and their local fabric. A further limitation, which shades into the third domains, is that the partners in the process must themselves be able to make and execute plans, at least to a basic level of competence (and often more).

In almost all of the large projects in the ETP, however, a substantial improvement in delivery capability has resulted from the combination of persistent monitoring; bump-up and penalty default; means for revision; and the skills of PEMANDU and other agencies in brokering compromise. Indeed, to the MRT and the PIPC could easily be added a string of examples, from the GKL "River of Life", to the building of an education export zone in Iskandar, to the development of a large cruise terminal at the Malacca Gateway.

C. Inducing New Capacities

The third domain involves the inducement of new capacities. When these capacities lodge in private firms, the problem can be seen as simply the public facilitation of Schumpeterian

[70] This term originated in a World Bank project in Madagascar, which both leveraged and catalyzed a critical mass of investment in a single area, focused on a specific industry (or several). In Madagascar this was most notable in the use of public funds to turn a private mining port into a multi-user facility that, along with "soft" and social infrastructure, facilitated growth in a range of related activities. The approach has since been attempted in a range of other countries, with varying levels of success.

[71] For a brief summary of the dispute, see: http://www.theedgemalaysia.com/highlights/233003-highlight-two-sides-to-pengerangs-coming-boom.html

innovation. Though under varying names, one could argue that this domain is the *locus classicus* of new industrial policy.[72]

One of the unexpected discoveries in conducting this study was the striking degree of commonality in the *kind* of capacities that we witnessed being developed by firms (and agencies) on the frontier. An early and dramatic example was to find a variant of the Toyota production system being implemented in a palm oil mill.[73] From there, the instances mounted, from rice paddies to orthopedic implants and mechanical joints.

The common features of these new capacities are short learning cycles, extreme precision, continuous monitoring and careful, often joint evaluation of results. These knit together activities as diverse as precision agriculture and rapid prototyping. They also resemble the governance and operational model of PEMANDU itself.

As a first example, PEMANDU plays a central role in capacity building in the rice paddy program in agriculture. The sector is facing the dual challenge of raising yields while dealing with a generational transition among smallholders, whose children have left for the city as Malaysia's urbanization rate has gone from 50% in 1990 to 72% in 2010. The programmatic response to this focuses on the organization of highly capable "farmers' organizations" (Pertubuhan Peladang Kawasan, or "PPK" in Malay).

The PPK are in effect cooperatives equipped with advanced management capacities. In this model, smallholders agree to join one of these companies, each of a scale of approximately 500 Ha. Members choose between leasing their land to the company (which provides the labor) or working it themselves. In either case the company levels the land and limes it (to precisely control water and pH levels). As part of the contract, the smallholder agrees to implement a set of "good agricultural practices". These practices involve increasing the precision of planting and harvesting, soil quality, water use and pest control (among other activities), as well as the detail and frequency with these are all monitored. Principal responsibility for this precision and monitoring lies with the smallholder themselves, if they choose to continue working the land, or with the management company, if they do not.

The agricultural extension officers and companies then periodically monitor the processes and results per field. They are guided by a "rice check" manual, whose method statement lays out four steps: manage the crop according to targets; monitor ("observe, survey and record plant growth"); compare and analyze "to identify problems"; and then take action to address those problems. There follow 17 pages of precise targets to monitor, introduced by an admonition to "learn from experience . . . and improve the management of the farm each season".

The Ministry of Agriculture (MoA) then works closely with PEMANDU to monitor the differential performance of the PPKs. Its efforts can be seen as an attempt at fundamentally restructuring the delivery model for extension services, using the PPKs as "super cooperatives" to foster capacity building—and especially the capacity for local learning through self-monitoring. This is done by setting up a chain of action, monitoring, problem solving and learning that reaches from the fields to the PPKs and extension services up to the Ministry, mirroring in agriculture the principles and processes of PEMANDU itself. Though the success of the program is far from assured, it is one of the most inventive and audacious of PEMANDU's reform undertakings. It is a

[72] Whether labeled as "market failures"—that is, implicitly as unnatural deviations—or cast as more central facts of organization, the list of barriers that have been diagnosed from time to time is long, including: the appropriation of externalities; loss-aversion interacting with extreme risk; information asymmetries; rent governance; the fundamental difficulties of collaboration between rational actors; or a range of other candidates. See, among others, the work of Hausmann & Rodrik (2003) on appropriation; Greenwald & Stiglitz (2014) on information and learning; Khan (2009) on learning and rents; and the authors cited above on trust, on collaboration, among others.

[73] Specifically, this occurred during our visit to Sime Darby's palm oil mill during our second mission, and was subsequently repeated at another large company's mill in our third mission. In both, it was clear that a generational divide separated the operations managers, who had a fluency with new production methods and were achieving substantial reductions in maintenance requirements, and with more senior corporate leadership.

means to spread advanced management techniques to smallholder rice farming, a sector often stereotyped as deeply traditional, while avoiding the top-down and often ineffective methods of some traditional extension services.[74] The results to date are inconclusive but show promise: on average, participants' income rose by 11 percent, and in the strongest performing PPKs yields have risen by more than 20 percent.[75]

A similar program is incipient in palm oil. As described above, one of the EPPs in that sector is to organize smallholders into newly formed cooperatives. At present these are focused on dis-intermediating middle-men, to increase smallholder income through higher prices at the farm. But in several discussions it emerged that the MPOB and others are intent in the medium- to long-term on using the cooperatives as vehicles for a similar type of capacity diffusion, monitoring and learning as the rice paddy PPKs.[76] Another, yet more incipient, program attempts to raise the average oil extraction rate (OER) in palm oil mills. As noted above, some mills have begun to institute advanced process capabilities; others, though, remain rudimentary, retaining manual labor in easily automated tasks. Across both classes, we were informed the most important influence on the extraction rate was the quality of incoming fruit, controlled in other divisions (for mills in large firms) and at collection centers (for stand-alone mills). Improving quality control at the latter, however, will require difficult trade-offs and interventions, involving local politics, instances of organized crime, and difficult short- and long-term trade-offs in regard to smallholder deliveries. It is perhaps not surprising, then, that the mills combined some of the most impressive instances of new capacities, and one of the most struggling overall KPIs.[77]

In other cases, PEMANDU has been more peripheral to the process of capacity building, as other agencies or organizations have taken the lead, albeit with strikingly similar programs. An example is the capital goods and upstream services sector for oil and gas. Petronas has long played a development role in the sector through its "vendor development program" (VDP), first established in the 1980s and managed by a dedicated unit. For the first two decades, this provided for preferential procurement from local firms for contracts under MYR 1 million. Firms seeking contracts above that amount had to demonstrate their capacity to deliver on contracts outside Malaysia. This met the policy goals of developing a base of local suppliers, while guarding against compromising technical quality on the most important contracts and inducing the most promising firms to diversify their customers and markets.

Over the last decade, however, this approach has reached its limits. On the one hand, technical demands—even on relatively small components –have risen as operating environments have become more difficult and safety regulations have increased;[78] on the other, the local supplier base had become complacent and hence (with a few exceptions) unwilling to undertake the risky pursuit of an upgrading strategy.

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[74] Those problems, realistically present in many extension services, are often considering the paradigmatic examples of "seeing like a state", in Scott's (1998) now famous term. However, it is not the case that all extension services operate in this way (to insist otherwise—creating a uniform and homogenous state—is to "see the state" in exactly the same way as the state is castigated for seeing).

[75] This compares, for example, to a 5 percent rise in US fields after implementing state-of-the-art precision agriculture systems. This is, of course, very far from a like-for-like comparison, but provides some indication of orders of magnitude for yield improvements.

[76] A similar type of program may also be conceived of for the palm oil mills themselves, where some have implemented advanced processes but others remain behind, either due to the lag in senior management referenced above or because some mills are independently-run and separate from diffusion networks. The key KPI here is the "oil extraction rate".

[77] The national average OER stands at only 20.25% this year, versus a target of 21.05%. The difference may appear small, but a 1% increase in the OER is equivalent, in terms of national GNI, to roughly a 5% increase in average yield.

[78] This is far from isolated in Malaysia; on the contrary, it is a global challenge for the industry, even in countries as seemingly advanced as Norway. It is being exacerbated by the practice of combining a range of highly sophisticated, specialized pieces of equipment, each of which may meet safety requirements when operated in isolation but create new, difficult-to-monitor problems when brought together in one process.

The new approach—patterned on the experience of the exceptional successes[79]—is intended to shift the balance of risk and reward for the supplier to incentivize capacity building and upgrading. Specifically, in the last year Petronas has altered both the criteria and the incentives in the VDP.

The former have become far more stringent. To qualify, firms must have: an engineering department; an R&D department (of any size); their own, internally developed product; and an innovative manufacturing process. Either product or process must be, if not patented, then patentable. Further, firms must complete one of the most stringent certification processes in the world, that of the American Petroleum Institute, within five years of entering the VDP.[80] As a revised incentive, those firms that qualify are then given a "first right of refusal" on any bid for their product (giving them, in effect, a guaranteed revenue stream).

Whereas previously the VDP admitted roughly 50 firms at any one time, and had a total alumni base of some 700, only 17 firms have qualified under the new terms. Over time, if they work effectively, they will provide both an inducement and a guidepost to young firms in acquiring these new capacities. Though an allied program under the MPRC provides a similar set of firms with support in accessing markets abroad, with the number of contracts they secure being an ETP KPI, the role of it and PEMANDU in the VDP is limited. Since at present Petronas seems quite capable of conducting this on their own, and might see any attempt at a larger role from the others as an intrusion on their turf, it does not seem as though the ETP's goals are jeopardized by this reticence.

Electronics is a less successful story. As described above, this sector has been in a long, slow collapse. Considering the competitive pressures on it, in some ways it is surprising that it has not fallen faster. In part this resilience is due to foreign firms upgrading the capabilities of their Malaysian facilities.[81] But there are also "green shoots" of innovative local firms. These incumbent firms and start-ups are redeploying accumulated, general skills (often related to process engineering) to articulate novel forms of co-development that have the potential to transform the industry.[82] Their activities range from rapid design and prototyping, to sophisticated forms of testing and the introduction of novel substrates that serve to simplify their customers' own processes.

However, the E&E NKEA as currently formulated is concentrated more on seeking the next generation of higher value added products than on leveraging these incipient process strengths. That is, the EPPs list investments in specific products ("IC design", "solar modules", "solid state lighting"), with KPIs tracking numbers of firms or progress towards the completion of discrete investments. While many of these investments may prove valuable, and several of them will directly overlap with the incipient capacities mentioned above, we did not observe the development of diffusion and monitoring mechanisms akin to those in the sectors already mentioned.[83] As a rough indicator of this, officials at both PEMANDU and MIDA could give us a range of examples of the type of innovative firms just described, but they had neither a ready-to-hand list of them or a count (in contrast to the known, 17 firms in oil & gas), nor still less a plan for systematically encouraging the development and consolidation of new capacities, as in the new VDP guidelines.

[79] The example we observed directly was Pro-8, a supplier of mechanical seals.
[80] Completing the API certification requires being audited several times over a period of two years, and often requires investment in new equipment and machinery (e.g., for advanced testing).
[81] This is particularly the case for Japanese firms, which have been investing to a (potentially surprising) extent in upgrading the capabilities of their Malaysian plants (Edgington & Hayter, 2013)
[82] To be more precise, this transformation is likely to occur regardless, but the question is whether it will occur in Malaysia in the necessary width and depth (and hence whether the industry will survive). Such a transformation is already occurring in China, Korea, the US and elsewhere.
[83] Although we understand that this may happen in time with the development of cooperation with AIM, with which the E&E team at PEMANDU is cooperating closely in finding and facilitating investments in enabling technology and directly in some firms.

Finally, perhaps the most troubling example comes in education reform. The firms we spoke to were quite clear that rising skills were needed from school leavers with vocational training, and that ensuring an adequate supply of them in the years and decades to come required deep reform in the existing school system. Few problems in public management are as challenging as this, and some steps have been taken.

However, defects of governance in the reform effort and a continued slide in performance on international scores do not augur well (see Box 2). In areas of more direct PEMANDU involvement there has still been some progress, such as regulations allowing new "special needs" schools and promising experiments in vocational training in tourism. If such results can continue to be scaled up at the margin, they may serve as the seeds for larger reform. Doing so will require more systematic joining-up of results and information within the ETP itself, so that lessons learned in one sector, whether within PEMANDU or from cognate agencies, spread to others (a theme to which we return in Section 6).

In all, though, the outcome in education calls attention to an unspoken premise or precondition of success in all the other areas: the cooperation, often committed, of the Ministry involved. When a Ministerial actor, perhaps inadvertently, stumbles on a system of governance which disables the system of bump-ups and penalty defaults which otherwise induce even reluctant actors to participate in incremental, transformative reforms, the result risks being a translation of form without function.

BOX 2: Education Reform

Education may be the most serious threat to Malaysia's long-term growth, which will require ever-greater skills and capabilities in the workforce. The need may be most pressing in agriculture and manufacturing. Both are reported as unattractive to the more skilled among young workers, just as the diffusion of process innovations mean firms require ever-higher skill levels to remain competitive. For both, the education system as a whole—including vocational training—will need to raise skill levels not at the top, but at the median.

But even before these additional burdens have been fully placed upon it, the Malaysian education system is struggling. In PISA tests it ranks below other countries in the region, and far below Vietnam, which has a sixth of its income per capita. Between 2010 and 2012 its scores in reading and science declined. Mean scores in mathematics improved slightly, but the distribution is slanted to the left, with the median score only at level 2 (out of 7). TIMSS scores have declined sharply in the last decade, as have some metrics of teacher proficiency. Universities, too, seem to be under strain, with youth unemployment higher among degree holders than any other education level.

Reform efforts, including a pilot program that uses private resources to introduce new school management techniques and teaching methods into 30 schools (50 are targeted by 2015) have produced very mixed results. The problems seem to be those that bedevil public education reforms everywhere, including extreme dependence on local context and the difficulties of monitoring performance.

Those problems would seem to make the sector fertile ground for a PEMANDU-like process. This is especially so given PEMANDU's emphasis on recursion, which would allow evidence from action in particularly successful or unsuccessful local contexts to suggest correctives elsewhere; and the need, through such action, to continually scale up until "doing " changes "being".

But while PEMANDU itself is active in the sector, its methods have to all appearances been commandeered by the Ministry to Education to create an accountability system—the "Performance and Delivery Unit" (PADU)—that mimics the responsiveness of PEMANDU processes, but is ultimately accountable only to the Ministry itself.

PADU is meant to implement a detailed Education Blueprint (many of whose actions and performance indicators have been praised by critics of the education system). But PADU's

governance is seriously flawed. Its Board consists of the senior officials of the MoE itself, so that its CEO may be perceived to be of similar stature to a Department head, without direct access to the Minister of Education. It similarly has no reporting line to the Prime Minister, the Cabinet or any other structure outside the Ministry. That is, it reports to those whose performance it is supposed to monitor.

PEMANDU was consulted during PADU's design, but was not involved directly in its set-up and only provided input to the development of the Blueprint. PADU has adopted some PEMANDU-like processes, such as a weekly dashboard and a weekly problem-solving meeting chaired by the second Education Minister. Naturally, the unit faces steep capacity challenges in making these work, and it has reached out for assistance. This openness provides some ground for optimism. But PADU remains a small unit, responsible for a vast number of difficult KPIs, and limited in its ability address inevitable coordination problems through a "bump up" process by the absence of a "penalty default". Perhaps as a result, among external (non-PEMANDU) stakeholders, those in charge of important pilots expressed doubt PADU would know much about their on-the-ground operations, and many interviewees felt that the unit was simply swamped by the size of the blueprint.

PADU may become more effective in time. However, the early evidence—interviews, the governance structure, the blueprint—gives pause. At the least, its governance should be reformed, so that the CEO has a direct reporting line to the Minister of Education cum Deputy Prime Minister, alongside periodic reporting to the Cabinet and Prime Minister (that is, provided with a penalty default). Similarly, the Blueprint's KPIs should be formally reduced in number, drawing on the understanding of importance that PADU itself has evolved through its initial actions.

A deeper, subtler source of pessimism is that the blueprint and PADU look so similar to the NTP and PEMANDU, and were initially produced by Labs, open-days and similar forms of inclusive planning. By replicating elements of the form, but not the most important ones, the function has been neutered, and a defense erected against change from outside. That is, by creating a self-reporting image of transformation, the Ministry may have inoculated itself against attempts at transformation from outside.

V. PEMANDU, THE MINISTRIES AND THE PUBLIC SECTOR

A. "Changing Being by Doing"

No "delivery unit" could long survive the hostility of a public sector determined to make obstructive use of its many veto powers and its hoard of indispensable information. On the other hand, the avowed purpose of such a unit is to induce the rest of government to act differently, to introduce change. Few large organizations welcome change. So the forging of effective relationships with the rest of the public sector, and particularly its core institutions, is both one of the most difficult and most important tasks facing a delivery unit.

Where the public sector includes large self-standing entities, such as utilities or government-linked companies (GLCs), the task becomes doubly difficult, since not only do the same considerations apply to them but such entities may—and often do—stand in a tense relationship to the government itself. If the "delivery unit" is seen as an agent of interference, it runs the risk of being shut out on both wings—by the civil service and the independent entities alike.

This is a challenge that, from our observations, PEMANDU has largely met, within the bounds of plausibility. While there have been complaints about speed and degrees of consultation, and there have been backlashes against specific programs, we saw little evidence of active or widespread hostility and evidence of support, in important cases expressed by emulation.

Several of PEMANDU's core operating principles contribute to this outcome, even if their operation ultimately depends on the credibility of the unit's mandate.

The first principle is called by PEMANDU "changing being by doing". This refers to a conscious strategy not to attempt substantial organizational change or contentious reforms right from the start, but to test, refine and demonstrate new routines through discrete, achievable but challenging tasks in the early stages. The emphasis is on projects that can show tangible progress within one to two years; involve direct government action (versus contentious regulatory changes) even if at a large scale; and avoid reforming existing institutions, though new ones might be seeded.

An example of this comes in oil and gas, where Petronas could easily have obstructed PEMANDU. Where some might have sought to challenge Petronas by seeking changes to regulatory authority (for example, in line with the Norwegian model),[84] PEMANDU avoided doing so. It likewise decided to avoid even the semblance of interference with the VDP, since domestic supplier development has long been a preserve of Petronas. Rather, it began with small-scale institutional creation, in the form of the MPRC; brokered the implementation of the EOR tax incentive; and helped deliver the PIPC. In doing so, it has complemented Petronas at one level, managing to build an open relationship with the company (at least at senior levels), while laying the groundwork for what might be larger changes later.

This approach avoids being threatening or disruptive from the outset, while still straining existing systems enough to demonstrate value and to reveal reliable and practical information about systemic weaknesses. The strategy is only then, with demonstrations in hand, trust earned, and information surfaced, to attempt more contentious or wholesale change under the aegis of a re-enforced, centrally ensconced PEMANDU, or—preferably—by a public sector organically adopting PEMANDU-style methods and outlooks.

[84] Though more than one observer has pointed out that the Norwegian model has its flaws, especially in a Malaysian context. Petronas' argument is that the Norwegian model places demands on human capital that a developing country cannot hope to meet, especially in the early years of the industry, and that if they are not met then the institutional framework can be *more* vulnerable to capture (or worse) than under a monolithic model. This is buttressed by the comparative analysis in Thurber, Hults and Heller (2010).

This strategy of incremental change harbors distinctive risks. It might, for example, divert energy and attention from larger reforms that would otherwise have occurred. It might result in the agency becoming trapped in project management rather than the harder graft of organizational reform, wasting the accumulated assets of trust or knowledge.

But these potential hazards pale in comparison to the risks PEMANDU would have run had it attempted wholesale reform at the outset, for example, by seeking to change affirmative action, directly confront Petronas or push for wholesale fiscal reform. That would likely have led to PEMANDU being seen as taking sides, inviting a backlash from multiple interests, necessitating the spending of large amounts of political capital to prevail and running enormous risks if the reforms did not prove a success. Since the agency at that stage would have had little to no first-hand information from which to draw its own judgments, it would effectively have been wagering its future and the ETP on the fallible results of outside analysts.

B. Avoiding Disempowerment ("That's Not My Decision")

Just as important as this sequential strategy is the role that PEMANDU has sought within the public sector as a trusted broker, providing process expertise and neutral intermediation rather than acting as decision maker.

In fact, in many of the conversations we observed, when a firm or department asked something of PEMANDU staff a common response was "that's not my decision", followed by "I will speak to that department and come back to you." So far as we observed, that response was taken credibly inside and outside government. Indeed for the private sector, this intermediary role seemed to be among the most valued aspects of PEMANDU's work. As one firm described it to us, PEMANDU "had opened pores in the surface of government". The CEO of Petronas told us that he sees PEMANDU as intermediaries that "know where we are coming from" but who also "have the trust of government".

We cannot be certain of how pervasive this trait is or specify its source. It does seem clear that this balance of not overstepping bounds by taking decisions that are rightly others', and yet of quickly and persistently channeling messages among decision makers, is embedded in PEMANDU's organizational culture.

A risk of this approach is that by not making decisions PEMANDU might err too much in avoiding disruption and hence become, to use a colloquial phrase, "fluffy". That this does not seem to happen results, in part, from its access to authority. In extremis, PEMANDU can seek and obtain a decision from senior levels, and this is widely known. Not using authority is very different from not having it.

Second, the monitoring processes, governed and fixed by the KPIs, continue inexorably. PEMANDU may not make decisions, but for the most part it will strive to make sure that it is known whether a decision has been made and what that decision was.

Third, PEMANDU's staff have strong material incentives for the Ministries and agencies they work with to achieve *their* KPIs. PEMANDU staff's remuneration is tied not to the performance of PEMANDU itself, but to the performance of the rest of government. We were told that this is well known, and means that many civil servants are aware that PEMANDU staff members have benign—if self-interested—motives in their dealings. It is notable that this incentive and evaluation scheme willfully disregards questions of attribution in the interests of furthering collaboration.

The most significant relationships of this type—PEMANDU as disciplined facilitator, rather than decision maker—may be those with the Ministry of Finance and the Economic Planning Unit. Neither PEMANDU nor the Labs have supplanted (or have tried to) the lead role of those Ministries in budgeting and resource planning. For Labs, as described in Section 2, both the EPU and MoF are always invited as members and their leadership must both give mid-point guidance and approve the Lab results. After such approval, if funds are required only in the next budget

cycle then requests will be tabled during the usual budget process in October, and if required sooner the EPU will conduct internal budget reviews to seek the funds and if available will seek the necessary legal or administrative approval to allocate them.

C. Risks, Caveats and Indications of Broader Change

One, albeit highly imperfect, indicator of the evolution of PEMANDU's reputation might be found in the strategic reform initiative (SRI) on civil service reform.

The program has been among the more troubled, and recently came to a standstill, unable to decide on a new Lab or to try again with previously failed projects. As an intermediate step, the PEMANDU team launched a call for proposals for new entry point projects, being clear that it could not promise budget support for them. The proposal requirements were non-trivial, likely requiring several days to complete. Within 4 weeks the call generated 113 proposals from 18 departments. From PEMANDU's own admission, when it began it would have been fortunate to receive a tenth of that number, and certainly not from so wide a swathe of government.

However, the travails of that civil service reform also indicate some of the limits and pitfalls of the model of engagement. Below we will suggest some of the ways these might be addressed, but for the moment it will be useful to describe the issues.

As noted above, several of PEMANDU's senior directors are former civil service officials. At middle and junior levels, though, a large proportion of staff has a private sector background. In its early stages the agency also worked closely with management consultants. As a result, there has been at times less hesitation than would be advisable in carrying across shallow understandings of "bureaucracy".

This was the case, for example, with the original plans for civil service reform. That included measures such as opening up the civil service to outside hires, especially at senior levels, and increasing the size and use of monetary performance bonuses. The plan does not seem to have considered, for example, the dangers of patronage and party-state blurring when allowing external hires; the effect on the morale of middle and junior officials and the consequent impact on the ability to attract young talent in the civil service; the risk of monetary incentives undercutting esprit-de-corps, and thus increasing rather than decreasing monitoring costs; and the perverse behaviors or herd mentalities that such incentives can generate.[85]

It is clearly beyond our scope here to evaluate such risks or the potential benefits of the measures. It is, though, notable that, to our knowledge, such an evaluation was not conducted before the measures were included. As a result, the civil service reform program displayed a certain naivety and distance from the reality of managing a large bureaucracy and seems to have had few chances of success from the beginning. Perhaps for that reason, and perhaps as a blessing in disguise, few to none of the reforms were implemented.[86]

Yet the broader relationship with the civil service did not seem impacted by this particular failure. In none of our interviews with civil service officers did it come up (perhaps simply because it was still-born and did not attract much attention, or because it was simply not associated with PEMANDU). Moreover, most of the PEMANDU officials we interacted with now have a nuanced and sympathetic view of the civil service, perhaps as a result of the years of working closely with it.

[85] Recent studies have pointed out some of these occurring in reforms in many places. One of the most intriguing has been a study in Nigeria of the effect of a new incentive system on public servants. It found that providing higher-powered monetary incentives actually diminished performance, while granting more autonomy increased it. See Rasul & Rogger (2013).

[86] The attempt also illustrates one of the potential limitations of the Labs model discussed above (the risk of groupthink). It also illustrates another risk that would be more fatal in a linear process without scope for self-correction.

In some cases, though, there were retreats to clichés about "bureaucrats" or a "bureaucratic mentality". These make deficiencies in organization or process into the result of a "culture" or "mindset" that is unchangeable, or very difficult to change. Ironically, such attitudes may then obscure opportunities for effective organizational change that are available now but were not earlier. In other words, remaining preconceptions in PEMANDU about "being" may be obscuring the potential to close the loop in "being by doing".

However, there are indications—albeit tentative—that the "being" of government is changing in subtle ways. In the most mature programs and projects that we visited, we found signs that ordinary civil servants have mastered the PEMANDU processes and are beginning to internalize its ways of working. For example, in both the GKL river clean-up and the agricultural extension office, the non-PEMANDU officials could describe the "bump up" and "revision" processes quite fluently and told us that they were running most of the meetings themselves, often without PEMANDU present. Private sector firms corroborated these changes, with several stating that "dealing with government is different now".

At a deeper level, some government departments are setting up small PEMANDU-like teams and processes to enhance their own work. An example of this is the formation in 2013, within the Auditor General's department, of a team to monitor and follow-up on the remedial and other actions recommended in its audit. This small team, which works closely with and is learning from PEMANDU, regularly updates a color-coded tracking system. Actions that are not being followed up are reported to a committee chaired by the Auditor General. The latter could provide a range of examples of performance audit actions that had been followed up through this mechanism in a manner that would have been unavailable in the past. However, given that this team is operating to some extent in one of the most sensitive and political of all areas, namely anti-corruption, it will pose a hard (and in many ways valuable) test of PEMANDU-like capacities.

More generally, it is too early to tell whether these indications of organizational and cultural change or the barriers to them will win out in the long-term, and, as with much of this study, any indications must be qualified by the risk of selection bias. What is clear is that, just as the ETP's long-term success rests more on inducing new capacities than delivering large investments on time, the long-term outcomes of the NTP as a whole depend at least as much, if not more, on closing the loop between delivering the "doing" and changing the "being".

VI. POTENTIAL IMPROVEMENTS AND EXTENSIONS

A. Internal Information Flows and Examination

Just as the problems of democracy are best addressed by more democracy, the limits that PEMANDU faces and the possibilities for overcoming them are best addressed by extending and deepening its techniques of self-scrutiny and self-revision.

A first and basic observation is that PEMANDU could consider ways to strengthen its internal information sharing. This is most pressing where problems cut across PEMANDU's own "siloes". This can occur in two ways: achieving goals in one program may require complementary action in others (and may even conflict with another program's goals); or a range of programs may face different manifestations of a common, but hitherto unrecognized constraint.

Though far from trivial, the first problem tends to be less serious and more easily identified than the second. By definition, each instance applies to a small number of sectors, often just one, and lends itself to being uncovered by the nested monitoring and bump up processes. Even if that takes time, the resulting request for action to another program will be strongly motivated, backed by an already-existing goal and the evidence of a prior search for other solutions. With no more than a handful of programs involved, the required information sharing can take place via informal networks among PEMANDU Directors. The principal limitation, then, will be resolving disputes that cross NKEAs (or even the GTP and ETP), and are therefore difficult to reconcile using the tools of dispute resolution that operate inside NKEAs.

For example, the working groups pursuing several of the EPPs under the "business services" NKEA—such as outsourcing and data center investments—sought changes to certain telecommunication policies, which they believed were necessary to achieve their goals. The telecoms team, however, argued that such changes would jeopardize its own KPIs, which depended on investment in telecoms infrastructure. Since the dispute cuts across two separate NKEAs, the bump up and penalty default mechanism could not be directly applied to resolve it. The two Directors discussed it informally (mediated by Idris Jala), but as of writing it had not been resolved.

Such conflicts are common in telecommunications regulation, and in utilities more generally.[87] They are inherently difficult to resolve by reference only to the "true north" of the GNI target, and PEMANDU seems to have done no better or worse than most attempts to resolve them. Since the unit does, however, have a range of tools for accelerating the resolution of such cross-boundary disputes *within* NKEAs, it would seem natural to consider applying similar ones *across* NKEAs. Doing so would clearly not guarantee success, and would require careful thought, not least in the formulation of KPIs intermediate between "true north" and individual targets. Nevertheless, it would seem a natural extension, not only for such conflicts, but also to accelerate the discovery and resolution of common needs.

That shades over into the second type of problem described above. Those may be more serious threats, both because they may apply to a wider range of sectors and because they may be more difficult to identify, not being attached to a specific goal. In fact, across the NKEAs several problems of this type have been arising, but this is not always apparent to the Directors heading them.

One of the most notable derives from the transition to new models of production and resulting shifts in the demand for skills. Where older or more entrenched managers told us that they still

[87] A particularly illuminating example is provided in Okazaki (2001), which describes how Japan's system of "bureau pluralism" broke down over precisely such a conflict between the Ministry of International Trade and Investment (MITI) and the Ministry of Post (which had jurisdiction over Japan's telecoms monopoly).

sought simplistic, semi-skilled and basic labor, just to turn machines on and off, younger ones, or more advanced entrepreneurs, told us something quite different. They sought workers who could monitor complex processes, problem-solve on the spot, and who could classify and escalate problems appropriately. They estimated that it took at least three to five years of experience on the same or similar processes to acquire these abilities. But this created a dilemma in that it was difficult to attract workers with the potential to develop such problem solving skills into manufacturing or agriculture and retain them for a sufficient period. Some suggested that the necessary acquisition period could be shortened to two to three years with well-structured and intensive training, but this would only partially solve the problem, given that attraction and retention needs would remain acute.

Meeting this need will be difficult and solutions will undoubtedly depend on collaborative and cross-sector problem solving. That, in turn, can be facilitated and perhaps in some cases prefigured by collaborative efforts within PEMANDU.

Turning to specifics, the unit's impersonal progress reports might be supplemented through an in-person, regular (e.g., weekly or fortnightly) meeting dedicated to identifying common problems. These might lead to and then be governed by multi-program KPIs, and particularly ones that would force greater attention to difficult emerging problems. One such might track employee retention beyond one year and three years in multiple NKEAs. Another might link education outcomes to sectors, by tracking the deployment and efficacy of career education programs (e.g., explaining how the skill profile and consequent career prospects have shifted).

A second observation—and a second step in the same direction—is that it may be beneficial to PEMANDU's long-run success to create a less frequent but regular process to subject programs to a form of intense cross-examination by other PEMANDU staff. Much more than outside advisors, PEMANDU itself has the capabilities and knowledge to question its projects and assumptions.

We noticed, however, that staff may be reluctant to appear to criticize peers and are caught up in the day-to-day management of a vast and ambitious process. As a result this potential for self-questioning may not be realized. To address this, it might be useful to create a quarterly or semi-annual retreat or stock-take, different from the public reviews, focused not on this year's project-specific KPIs but on the long-term attainment of "true north", asking if each project is ambitious enough and what assumptions are ripe to be tested. The format of this would need to provide some "safety" for those cross-examining, so as not to create barriers to information sharing and other forms of tension in regular work.

Last, PEMANDU might consider ways to seek distant and external viewpoints more systematically and rigorously. It already has an external review board, but this might be supplemented by more challenging and in-depth interactions, such as quarterly invitations to critics of the unit to engage with its senior directors. It might also interact more systematically with the most advanced firms, those that typify the new capacities it seeks to build. It might, for example, ask them to be on a council or councils with an explicit mandate to them to be provocative and challenging.[88]

One particular benefit of such processes would be in identifying a range of potentially problematic efforts before they proceeded too far. As noted in Section 2, some projects were worthwhile, perhaps even indispensable, to establish a working relation with large and unwieldy bureaucracies; but there is always the risk that such projects will become insular ends in themselves (creating parallel organizations with limited reach), rather than bridges to more comprehensive change. However, it is entirely possible that such programs could meet their KPIs, at least for the time

[88] An example might be found already in the "30 club" in palm oil, which seeks to systematically bring together smallholders who have either achieved or made a credible commitment to achieve a yield of 30 tons / Ha. This "club", which at present is used principally for diffusion, might become a vehicle of both criticism and support were it to be given a formal, advisory role to the MPOB and/or PEMANDU.

being. Harsh, but structured, self-examination might then provide a means to more reliably identify programs that, though meeting their internal goals, might be reconsidered.

B. Pursuing New, Harder Opportunities

It seems likely that the type of information sharing and assumption testing described above will lead to the identification of both new and more difficult tasks. In particular, these are likely to involve closing the loop in "changing being by doing", involving the difficult task of organizational change, and a more general shift from the first two domains of problem solving to the third.

With regards to "changing being by doing", a place to start might be for the unit to ask systematically of each program, "is there a need and opportunity to change 'being' that is not being taken?" Staff could question each other about the extent of trust they have created with other agencies, the momentum or lack of it for change, and whether priorities should or should not remain tactical or structural.

The answers to these questions may not always lead to shifting emphasis to organizational change—in many programs they will not. In several programs, though, further progress will require such change. The projects done to date have created trust with those agencies, and a momentum for change that could now be capitalized upon.

To borrow one of PEMANDU's own metaphors, beginning organizational reform from 30,000 feet would have been a mistake. By starting at 3 feet, and then burrowing underground to discover root causes, PEMANDU now has some understanding of what bottlenecks arise and how. It may squander the potential this creates if it does not now address itself to those underlying issues.

Such attempts at completing the reform of "being" within government are particularly difficult but far from unique instances of the third domain of problem solving ("inducing new capacities"). More generally, as the Malaysian economy itself advances, and as the global economy continues to change, that domain—in public and private organizations—will become increasingly critical. The returns to new capacities, and the dangers of remaining with the old, are rising rather than falling.

As noted in our deep-dives, PEMANDU's record in the third domain is more mixed than in the first two. This does not imply that its abilities in that domain are fixed (it is quite possible for organizations to increase their capacity to induce capacities in others).[89] But there is, in organizations as with individuals, a frequent temptation to remain within the comfort zone of what one is good at. In that vein, we did notice a tendency to leap at problems in the first two domains more readily than in the third.

If this tendency were to become fixed, the transformation program might risk becoming one of a few reforms and big projects, rather than one that induced a more deep-seated, necessary and long-lasting change in the structure of government and the economy. Its processes and capacities would then be instances of exceptional tools for project management—of use, but with an even larger potential left on the table.

There is, then, a case for a self-conscious shift of emphasis towards the problems of capacity building, and a corresponding reduction in those of project management. One suggestion for doing so might be to add to a tally of the number of projects that fell under each domain of problem solving to the semi-annual and annual reviews, while setting a target across the transformation program and within PEMANDU to continually shift towards the more difficult domain.

[89] The US military, in its variegated arms, furnishes perhaps the most striking example, particularly when comparing its capacities in this domain before World War II—being mostly non-existent—and after—when it was instrumental in facilitating waves of disruptive technological innovation by deploying instruments from procurement to direct funding on an explicitly open basis.

C. Presentation

A third area of suggestion relates more to form than function, but may have important long-term consequences. After observing it up close, we believe that PEMANDU has outgrown its initial presentation. In particular, prior presentations underplay or leave out some of its fundamental innovations and practices. Examples include the "70/30" ratio; the interaction between changing KPIs and "true north"; and the full story of the working groups and councils, especially how their processes induce participants to surface and solve coordination problems on their own, without recourse to the highest authority.

Instead, those prior materials can suggest, misleadingly, that the principal innovations are limited to more deliberate and inclusive initial planning linked to more rigorous monitoring of execution (the descent from 30,000 feet to 3 feet), rather than the construction of a more adaptive and ultimately more effective system that learns how to revise goals and methods in the process of implementation itself (what happens at 3 feet, or underground).

The use of authority and the unit's relation to the rest of the civil service is a particularly striking aspect of the misunderstanding that can result. We have found that many believe PEMANDU is only possible in a "perform or perish" environment, where the agency regularly employs authority to threaten punishment for non-performance. In contrast, we have (to date) not come across an example of a civil servant being fired (or put on reserve) for not meeting KPIs, and several observers remarked that PEMANDU operates "with limited political capital". It is able to do so precisely because it uses authority as the last recourse in a system that fosters deliberation, *not* the first response to unsatisfactory performance in system of rewards and punishments.

PEMANDU's presentation of its macro-economic goals is more ambiguous. As described above, those goals have an instrumental use, prompting and disciplining the process of revision. For that use, the goals' clarity, size and importance are vital.

But evocation of these goals can lead to grandiloquent claims. Some of PEMANDU's own materials imply a claim that the agency is the primary actor responsible for Malaysia's recent economic performance, or even that its processes are able to produce any reform and are responsible for all of those passed. In doing so, the agency makes itself something of a lightning rod for criticism: critics may ask, if it is so effective, why has it not solved problem X? It is not enough to say in such cases that PEMANDU cannot substitute for the necessary politics of reform; the agency itself creates a vulnerability to such criticism by the size of its claims. Likewise, in appearing to claim credit for Malaysia's macro performance, it leaves itself vulnerable should that performance dip.

The need to clarify PEMANDU's presentation is all the more pressing because as word of the NTP spreads and interacts with the broader trend for "delivery units," demand for its services grows outside of Malaysia. PEMANDU is already engaged in Africa—in Tanzania and recently in South Africa—and in the Indian state of Maharashtra, and has developed its own set of process guidelines, attached as Annex C. In this context, the more precisely and accurately PEMANDU states it purposes and the kinds of collaboration needed to achieve them, the more likely it is to attract partners whose expectations accord with its expectations and capacities—and hence the greater the chances that PEMANDU and Malaysia will achieve the promise and avoid the risks of such expansion abroad.

D. Applications Abroad

From one perspective, expansion is almost irresistible: Advocates of PEMANDU assert that it has helped transform an advanced-country innovation, the delivery unit, into an institution of new industrial policy and government reform that credibly produces results across a broad range of projects in many different sectors, in the process putting to use the country's checkered history of development efforts. It is natural that countries confident of their capacities to grow but bedeviled by "implementation" problems will seek to learn from PEMANDU's experiences, and will see collaboration as the best means to do so.

It is natural too for PEMANDU and the Malaysian government to welcome this interest, as recognition of their efforts and as a way to contribute to and possibly increase their influence in the development of the global South. In any case international consulting firms are active in the marketplace, and to the extent that they are offering the linear model or a subset of PEMANDU-like practices (such as the Labs alone), it would be at best perverse and at worst damaging to the countries in question if PEMANDU itself refrained from participating.

But there are risks to engaging abroad. If the analysis so far is right, establishing a PEMANDU-style delivery unit, though it does not depend on many pre-conditions, requires at least three: a political consensus at the top in favor of improvement (or alternatively the absence at the top of a blocking coalition against change); an officialdom that is, or can be induced to be, responsive to the information-forcing decision process of bump ups and penalty defaults; and at least some positive variation in the capabilities of departments, agencies and firms, that can provide in a sense "a place to start".

Failure to secure these conditions is likely to result in failure, and failure abroad would be as costly to PEMANDU as success would be beneficial.

However, early on PEMANDU itself came upon a method of ascertaining whether the topmost political conditions are favorable to continuous improvement, and has developed, in the method of bump ups itself, a means of both checking on and encouraging the propensity of official actors to engage in the information sharing and deliberation required for recursive implementation. Adapting these methods to the conditions of foreign engagements could substantially reduce the risks to PEMANDU of working abroad.

For the consensus pre-condition, recall Idris Jala's early retreats with cabinet members, exploring their disposition to change over several days. His willingness to take the lead in organizing PEMANDU depended on finding, through this informal but searching canvas, that the high-level political condition was met. In engagements outside Malaysia PEMANDU might insist on a (slightly) formalized variant of this process: Cabinet members (always including the Minister of Finance, the head of the civil service, and the Ministers whose departments are most likely to be implicated in reforms) in host countries and their PEMANDU counterparts would use the occasion to sound each other out.

The results of such retreats would hardly be conclusive. But failure to participate, active obstruction or grudging participation might caution against collaboration, or point to the need for changes to facilitate it. This is a very different condition to the oft-cited "political will", which in many instances means authorization from the head of government. The precondition stated here rests not on the fiat of the Prime Minister or President, but on a significant (though not universally enthusiastic) consensus in cabinet, one sufficient for all (or almost all) Ministers to give up several full days of their time—not just once, but several times over—to frame and authorize the process.

Making such retreats a pre-condition of engagement would also reduce the temptation for all parties to by-pass the cabinet—in agreements between PEMANDU and individual ministries, for example—in the interests of coming to grips with urgent problems, but at the risk of making reforms the isolated program of a single Ministry or agency, or hostage to distant and perhaps hostile centers of power.

There is likely no punctual way of assessing the current capacity of government officials for deliberation, and still less how those capacities might change in response to a system of bump ups and penalty defaults. But, as PEMANDU's experience shows, close attention to how such a system is operating—where it yields collaboration versus where it founders on resistance rooted in strategic calculation or habit—provides both an important check on the prospects of reform and, where prospects are clouded, valuable indications of possible correctives.

Similar reasoning applies to the third threshold. On the one hand, it seems likely that it can be met in most settings: It calls, after all, not for many to have such capabilities, but for some. Integration in global supply chains more and more *requires* the ability to act recursively, so—except in economies entirely shut out of such markets—some such firms are likely to be present.[90] Recent studies of institutional reform have attested to positive variation, of the type needed here, even in the least-developed countries.[91] So the pockets of capability are likely to be present; the question will be where to find them. Again, this is precisely the function of a PEMANDU-like process, so long as the tool used is more the nested monitoring and less the Labs: the latter may, in advanced settings, reveal the presence of such capabilities, but will do a poorer job (and may even be misleading) than the routine processes themselves.

The latter two threshold conditions then set up a potential dilemma, in that they can most accurately be tested only in the doing. In practice, this will likely resolve into a set of more tractable judgments, such as whether to begin with a more limited set of Ministries and programs, and balancing the needed resources—from PEMANDU and from its foreign partners—to ensure an honest attempt while avoiding costly distractions, should the attempt fail. Those initial judgments will require knowledge of the local context and political economy, and subsequent decisions will require a careful understanding of the unfolding process and its results (or failures).

PEMANDU is likely to have some knowledge of the state of affairs through its collaboration with foreign partners. But that understanding could be improved and made more accessible to action if the operation of the processes were opened to more systematic and joint review. A straightforward way to do this—consistent with the recommendations above for increasing the capacity for domestic self-scrutiny and revision—would be to establish an international peer review in which each country with PEMANDU-like projects, including to be sure Malaysia, presents one of its most and one of its least successful experiences in detail for mutual scrutiny and comment. The goals of such a review would be to diffuse successful innovations rapidly, to help guide the investigation of root causes of problems and to devise countermeasures when developments are blocked. Such review will not guarantee success; but early, joint diagnosis of problems reduces chances of failure, and makes its causes common knowledge, decreasing the likelihood of mindless repetition and, perhaps, the tendency to look for scapegoats.

In any case, the stakes are high. Industrial policy has traditionally been seen as a means of state-building, and an assertion of sovereignty. PEMANDU is arguably contributing to Malaysia's growth, but it is doing so in an epoch in which, more than before, state-building goes hand in hand with building regional economies and global institutions. If PEMANDU's experience were to make a discernable positive contribution when adapted by and applied in other countries, it could not only help disseminate a different way of conducting new industrial policy, but also help provide a new example of what industrial policy can mean for international cooperation.

[90] Locke (2013).
[91] A range of examples is provided in Andrews (2013), Chapter 7.

VII. CONCLUSION

A. Lessons for Delivery

The central lesson of this study of the NTP and PEMANDU's operation is that the way to deliver improved implementation of government goals is to recognize that goal-setting cannot be separated from implementation, and that solutions to problems that arise amid implementation will often lead to important changes in goal-setting. So, to take one example, collectives are to be introduced into various sectors of agriculture to dis-intermediate middlemen; but, as difficulties arise in diffusing good agricultural practices, cooperatives come to be seen as a vehicle for introducing new and more adaptive forms of governance. Such examples multiply, in different but related forms, from the emergence of biomass as a new economic area to a shift of strategic orientation within electronics.

Moreover, this recursive learning goes "all the way down": The setting of goals is itself a recursive process. So, within the ETP and GTP Labs, "Week One" solutions are later tested against the original goals and new understandings and are revised accordingly. Conversely, where recursion breaks down and programs are not subjected to strong enough critique in and through their implementation, ill-conceived projects can continue for some time—or a sense of strategic priority can be lost in the pursuit of action for its own sake. Put as a paradox: The way to get concrete results is not to focus on executing a well-conceived plan, but to acknowledge that, in practice, all aspects of the program must be open to change, on the basis of information obtained through attempts at "implémentation," and therefore to institutionalize processes that bring this information to the surface while maintaining the momentum of action.

Some of PEMANDU's most important innovations are institutions for making this kind of fluidity manageable and productive. The system of bump-ups and penalty defaults make it difficult for peers and subordinates to hoard information strategically. In this sense the system of monitoring is less about checking compliance with targets than ensuring the flow of information necessary to meet them. It also makes it difficult for anyone to exercise vetoes based on authority or position rather than on compelling argument. In other words, PEMANDU gets things done by promoting deliberation, sometimes forcefully.

Surveying where and how this approach has been most effective, we found that PEMANDU has had some of its strongest and clearest results in delivering solutions to the category of problems typified by large, capital- and regulation-intensive projects. In such circumstances, honest and unexpected disputes arise continuously, and they would probably languish without PEMANDU's brokering or without the pressure that its "bump up" processes create. For such projects, both insiders and outsiders drew a sharp contrast between "before" and "after," most vividly in the case of the Pengerang terminal and the MRT.

The unit is involved at a similarly deep level for the second category of more conventional, one-off regulatory changes, at least where no other intermediary with its competence is available, where the sources of dispute are technical rather than political, and where many stakeholders are involved. The clearest cases are changes in detailed regulations where broad agreement is in place but where key dates or quantities are still being debated, such as the size and design of a special tax rate or the date of introducing a new fuel standard. The unit is less central where the issue is as much political as technical, where its delivery is confined to one or two organizations, or where an existing organization already has PEMANDU-like competencies. The introduction of the GST meets the first two criteria, while the improvement of the business environment under PEMUDAH meets the third. In such cases, PEMANDU may not be vital, yet it can remain helpful, particularly in connecting the initiative to the ETP via its regular monitoring, thereby lending momentum to others.

In the third category of problem, the inducement of new capacities for recursive learning in key actors—perhaps the most challenging but also most rewarding of PEMANDU's tasks—the variance in outcomes is greatest. This is perhaps to be expected: It is the domain where

PEMANDU is most dependent on deep and continuous collaboration with major (often ministerial) actors, but also, given the potential for new capacities to threaten existing interests, the area where resistance is most likely to occur.

Nevertheless, there are instances where PEMANDU is catalyzing institutional innovation and capacity development in tandem with other government agencies. This seems to be occurring in several segments of palm oil, involving the cooperatives of smallholders and the potential to spread lean techniques in the mills. It may also be emerging in areas such as medical devices, LEDs, healthcare or diagnostic testing (with several of these in the same geographic region). It is perhaps most evident in some parts of agriculture, especially in paddy. Indeed, agriculture as a whole captures some of the limits as well as the promise of PEMANDU, combining in one sector a questionable dairy scheme, promising aquaculture investments, and, in paddy, means of organizing the diffusion of capabilities that are in some ways at the very frontier of industrial policy.

In other sectors, PEMANDU may not be directly involved, but that is not an acute problem for the national transformation program as a whole. In such cases, public- or private-sector organizations are already developing forms of sophisticated monitoring and revision. This seems to be the case, for example, for oil and gas equipment, given Petronas' revisions to the VDP, complemented by the activities of the MPRC, which was itself created by the ETP and utilizing PEMANDU-like processes and capabilities.

Of greatest concern—in some cases posing a severe long-term threat to Malaysia's competitiveness—are those cases where the exclusion is more substantial, and the influence of the transformation program and PEMANDU have been largely neutered. These cases demonstrate that even a monitoring-intensive process like PEMANDU's is vulnerable to subversion. Indeed, one of the most effective ways to subvert it is to mimic the form of PEMANDU while adjusting its governance to remove the threat of ultimate accountability, and then to overload it with thick and unfocused initial plans. Such subversion is effective precisely because it concedes and manipulates the consensus that recursion and continuous monitoring are necessary. It thus attests to the compelling appeal of PEMANDU's recursive governance even as it frustrates it. As La Rochefoucauld might have said, "Bureaucratic scheming is a tribute that vice pays to virtue."

B. Lessons for Industrial Policy

The goal of traditional industrial policy was, through the substitution of imports (or, later, the promotion of industrial exports), to build the core of a modern, industrial economy, or, more modestly, to build at least some of it, on the assumption that the expenditures and opportunities created by, for example, a railroad and a steel mill would induce complementary investments in the others.[92] The goal of new or open industrial policy, of which the ETP is an important variety, is in contrast to identify constraints to economic growth and to successively remove them.

One method for identifying such constraints is called "growth diagnostics".[93] Its core idea is to survey the economy as a whole, to see whether and to what extent the chief, present obstacles to growth are (for example) an overvalued exchange rate, a misdirected energy subsidy, a failing school system, lack of certain industry-specific public goods, or some combination of these and others.

The advantage of this panoramic approach is that it increases the chances of identifying crosscutting problems that knowledgeable actors have come to take for granted, or that they have assumed to be peculiar to this or that sector—as well as the chances of spotting novel opportunities that incumbents, while absorbed in the daily struggle to do better at what they do, simply overlook. A disadvantage is that it is hard to prioritize a heterogeneous list of constraints (e.g., to tackle the exchange rate to facilitate manufacturing exports, or to aim to increase

[92] Among others, see the classical treatment in Hirschmann (1968).
[93] Hausmann, Rodrik and Velasco (2008)

productivity so manufacturers can compete without devaluation). Another is that panoramic goal-setting, even if it involves consultation with a wide range of stakeholders, does not lead naturally to even a preliminary plan for implementation. Conception and execution will be only partially, even accidentally joined—and the process for arriving at the first will not establish the foundations for the second (much less establish a recursive system of mutual correction).

There have been some limited attempts to connect growth diagnostics with a context-sensitive industrial policy to translate high-level goals into action plans. But these efforts themselves tend to remain abstract and institutionally speculative—moving, for instance, from the plausible generalization that public-private collaboration in new industrial policy requires increasing "bandwidth" to accommodate the higher frequency and increased detail of information exchange to a proposal for "permanent working groups around solving the common problems faced by existing industry."[94]

The alternative approach, of which PEMANDU is an example, starts the search for constraints locally—by convening the actors who best know their own situation– and, right from the start, joins an examination of obstacles with an investigation of possibilities for overcoming them. The forum for doing both is initially the Labs, which begin a search that is continued in the doing.

The advantages and disadvantages of this approach to open industrial policy are the inverse of those associated with global scanning. Priorities emerge naturally because goal-setting and implementation are connected: Priority goes to goals that create the foundations for implementing a whole program of reform. But there is the danger that cross-cutting themes will be ignored and that more speculative opportunities, remote from current experience, will be overlooked.[95] As we have seen in the case of tardy realization of the cross-cutting changes in the demand for skills, and the recognition of the potential for a bio-mass industry, in the case of PEMANDU these dangers are actual, rather than potential. The organization has the resources to address these problems, but their existence confirms the adage that, for every strength, there is corresponding weakness.

Yet a third approach, combining features of the first two, is the Chinese system of "point to surface" experimentation.[96] As in the first, global scanning approach, large constraints are identified centrally: How can the economy master the efficient use of foreign technology? How can village migrants be integrated into urban centers? But responses to such questions are sought locally through extensive pilot projects at the municipal or provincial level that test alternative approaches to solutions. As successful variants emerge they are transferred from the local "points" of experimentation to the national "surface" of general policy.

This system is not linear, since there is no pretense that the center knows how to achieve the goals it sets, without being recursive in the same way that PEMANDU is: Localities, provinces and individual party officials are highly incentivized to achieve results—through the prospect of promotion or a share of the returns to success—and, as in the linear model, they are left largely on their own to devise the means of doing so. The center picks winners, not *ex ante*, but only after a convincing demonstration that their solution has in fact won the contest to find one. PEMANDU might adopt elements of such an approach in domains such as the diffusion of good agricultural practices, where clubs of high-productivity producers might be rewarded for their achievements, provided that their experiences are shared.

A final, if more limited member of this family of industrial policies is state-sponsored venture capital. In venture capital, investors (the limited partners in the private version) contribute to a

[94] Hausmann, Cunningham, Matovu, Osire & Wyett (2014), p. 28. A number of Latin American countries have experimented with national-level public-private Competitiveness Councils, in part inspired by this idea. For a study of these, see Schneider (2013).

[95] However, other institutional means may be used to remedy this gap, depending on context. For example, venture capital is well suited to exploiting such opportunities, and has been used effectively to develop high-tech sectors in a few, small, peripheral economies, such as Ireland, Israel and Taiwan, China. A precondition in these has been a large, well-educated diaspora. See Sabel & Saxenian (2008).

[96] As described by Heilmann (2008) and Xu (2011).

venture fund. The fund's managers (the general partners in the private variant) then purchase minority stakes in start-up or early-stage firms; very actively monitor the progress of each; intervene when there are problems; and exit the investment either when the firm goes public or its problems are judged unfixable. VC oversight of the development of portfolio firms is by the recursive methods familiar from PEMANDU: incessant contact between a designated fund manager and management of portfolio firm; weekly reports on the firm's progress towards milestones by the designated fund manager to her colleagues; quarterly review of the progress of the fund's firms. Persistent problems are bumped up the VC managers, who may engage in joint problem solving with the firm; the penalty default for continuing failure is a change in firm management mandated by the VC.[97]

Venture capital is strongest again just where PEMANDU is weak: in extending the capabilities of the economy to speculative opportunities beyond the ken of incumbents. VCs are looking for firms that are (or could be) solving problems that potential customers regarded as insoluble, or didn't know they had; when supply meets demand for such emergent solutions, new markets are created, or existing ones disrupted.

But venture capital is inherently limited as an instrument of industrial policy in developing countries (and many developed ones), quite apart from its specialized focus on activities that don't yet exist. In a developed system there are many venture capitalists; they must compete for the best of the many deals presented to them. In developing countries the public venture fund is typically a de facto monopolist. Instead of choosing among deals it is often obligated to generate ideas for major projects, to organize coalitions to support them, or to recruit and champion groups of innovators. Taiwan and Israel, the two countries that have relied most extensively and successfully on venture capital as a tool of development could both draw on substantial Diasporas of highly trained engineers and scientists to connect them transnational firms and assure sufficient deal flow.[98]

In sum, the new family of industrial policies is responding to uncertainty about the emerging contours of a competitive economy by encouraging experimentation, Often, but not only, by means of the deliberation inducing mechanisms that PEMANDU has institutionalized. It is likely that we are at the beginning, not the end, of the proliferation of these new forms.

C. A Question for Economic Development

From the second half of the 19th century almost to the present day, economic development has often been synonymous with industrialization. Technological advance was embodied in manufacturing equipment; moving workers from low-productivity jobs in agriculture to high-productivity jobs in industry increased the efficiency of the whole economy. The faster industry expanded, the more rapidly the economy grew. [99] Production of natural-resource-based commodities—agriculture, fishing, mining—was conversely thought of as a development trap. Little know-how, beyond that bequeathed by tradition, was thought necessary for these activities: Such technical expertise as might be required was not generalizable to other purposes, and it was in any case in the hands of foreigners, who might withdraw from a developing economy if the (notoriously volatile) price of commodities turned against them, or if resources were depleted, or simply if better opportunities arose elsewhere. There was a reason, in such circumstances, that no one thought twice about speaking of the ensemble of government interventions for encouraging economic development as "industrial" policy.

[97] See Jordan & Koinis (2014) for discussion and references to the literature.
[98] Sabel, & Saxenian (2008)
[99] There has been a persistent debate over the relative priority of manufacturing and services, from South Asia to Africa and Latin America, and the problems of "deindustrialization" or "non-industrial growth". The case for manufacturing has been brought into the "new industrial policy" debate by Rodrik (2013). Much of the debate, however, implicitly discounts primary production (such as that discussed here), and, being based primarily on sectoral GDP decompositions, can be somewhat abstract (and are necessarily based on the past). Even in Malaysia itself, we found a quite widespread reluctance to be seen as pursuing a "commodity" strategy.

Development in Malaysia suggests a different story. Manufacturing, especially the electronics-assembly industry centered in Penang, is the most troubled sector, not the most dynamic. The problem is not just, and perhaps not primarily, low-cost and capable Chinese competition: There are important indications from industries as different as footwear and cell phones that—as the complexity of products increases and as the rate at which they change accelerates—requirements for higher quality as well as the increased integration of design and manufacture are coming together with a new generation of automation to reduce the demand for low-skill, high-volume assembly.[100] At the very least, it is clear that such activity (high-volume assembly) is not the first rung on a ladder leading to increasing capabilities for workers or firms.

We catch a partial glimpse of the future of industry not only in Malaysia but also generally in the success of Pro-8, the manufacturer of mechanical seals for the oil and gas industry, and Straits Orthopedics, the high-value-added medical-devices contract manufacturer: Both use sophisticated, computer-aided design tools networked directly to multi-function machining centers to serve highly specialized regional markets that maintain unforgiving standards. They create employment opportunities for engineers and (a few) manual workers with computer skills.

Developments in the commodity-producing sectors—palm oil, along with oil and gas, first and foremost, but paddy rice as well—are surprisingly similar. Enhanced recovery of oil requires more demanding technologies and, with it, higher skills, as evident in Petronas' revision of its VDP requirements. Training demands are going up in the cultivation and harvesting of palm oil, in oil pressing, and in paddy cultivation as it becomes clear that good—exacting—production practices significantly raise yields and returns. Skill needs are increasing for related reasons in tourism and even in cosmetology.

Indeed recent developments in Malaysia suggest that the provision of services and the production by sophisticated means of natural resource based commodities today demand the same kind of skills as, and help generate the same general capacities as cutting-edge industrial production: They require the ability to closely monitor the production process, learning rapidly to correct failures and generalize successes, all the while scanning for relevant innovations outside the circle of immediate experience. Developments in Latin America—soy in Argentina and Brazil; rice and wine in Argentina; cattle in Uruguay—point to the same result.[101]

If there is a difference between the sectors, it is, perhaps, that commodity production and services seem to be creating more low- and mid-level jobs, with possibilities for improvement, of the kind that might serve the needs of the masses of job seekers with limited formal education. From this perspective, a central question of development is no longer how to competitively industrialize, but how to encourage growth in multiple sectors through the inducement of new skills and capacities.[102] This also raises the troubling question of what to do if even a successful strategy is unable to create the jobs needed at a sufficient scale.[103]

For many, understandably, the most compelling evidence of PEMANDU's success are its contributions to the timely execution of demanding investment projects and, more diffusely, to making government more responsive. But if the locus of development is indeed shifting—from a

[100] As described in detail (through the lens of labor standards) in a series of papers by Richard Locke, drawing on evidence from corporate databases to hundreds of interviews and site visits, and synthesized in Locke (2013).
[101] See Lederman & Maloney (2007); Sabel (2012).
[102] That implies, though, a quite different set of tasks from "horizontal" reforms as classically formulated, which relied on passive and once-off changes to an encompassing "business environment". While useful in many instances, such reforms are increasingly likely to be sufficient, if they ever were. In the language of this study, those are first domain problems; the tasks argued for here lie squarely in the third domain.
[103] A recent estimate has it that almost half of all occupations are vulnerable to automation over the next several decades Frey & Osborne (2013). Recent trends in China also indicate that rising wages there have not led to jobs being moved to lower-wage countries, but rather to jobs being given to robots (for which China became the largest market in the world in 2013). Once the spread of lean production to agriculture and services and the development of services robots and automated agriculture are added to this mix, the prospects for a sustained and structural downward shift in the job intensity of economic activity may be non-trivial.

focus on products and industries to a focus on process capacities across sectors—then, in the long term, perhaps the greatest of PEMANDU's innovations will have been to provide an example of the mechanisms for recursive policy making, along with opportunities for the acquisition of the skills needed for such efforts to succeed. It is that contribution to Malaysia's pioneering effort to make its "old" sectors into new opportunities for growth that may eventually be its largest contribution to national transformation.

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ANNEX A: INTERVIEWS AND METHODOLOGY

The primary material for this study was gathered in the course of three field trips by the authors to Malaysia between August, 2013 and May, 2014. The organization of the trips, including the meetings, was facilitated by PEMANDU (which did not, however, financially sponsor the study), based on general guidance and specific requests from the authors. This of course risked selection bias, but there was no other way to achieve the granularity of resolution the study demanded. Further, the risks were mitigated through the number and range of interactions and organizations, as well as the methodology chosen for the interviews

In total, 59 meetings (formal and informal) and site visits were conducted. These involved representatives from approximately 69 organizations (excluding PEMANDU itself), divided almost exactly between private firms and public (or public-private) agencies. The full list of these organizations is provided in Table 1 below.

Roughly a third (22 of 69) of the organizations were engaged in formal, individual interviews, and roughly another forty per cent (30 of 69) were engaged in formal, group interviews (Figure 4).[104] The remainder were engaged in an informal setting, albeit with similar interview methods applied as in the formal settings.[105]

The representatives of the organizations were subjected in the interviews to a form of forensic interrogation. Most interactions began with a presentation from the interviewee(s) of their organization and the NTP projects in which they were engaged. Drawing on prior desk research or personal experience, the authors then posed granular problems of implementation that such projects and stakeholders could be expected to face, and asked for detailed narratives of how these had been resolved (or would be, if the project were early and the problem hypothetical). Where interviewees were unable to grasp the problem, or to provide such a narrative, and PEMANDU officials concurred in the judgment that neither was forthcoming, the sector or program in question was flagged as an area of weakness and claims made for it were discounted; where the converse held, the narrative was subjected to sustained cross-examination by both authors to probe its credibility, as well as to ascertain the specific roles and actions of the parties involved. In each engagement, typically 2-3 such problems were posed, with the average interview estimated to have lasted between 90-120 minutes.

To provide an idea of the problems posed, a representative sample might include:

- The tension between providing support (e.g., grants or preferential procurement) on a liberal basis, to build a base of some capabilities but with the risk of inducing complacency or capture, and on a strict basis, to work with the most promising companies but at the risk of low inclusion or "additionality"—for example in oil & gas local content development, R&D in downstream palm oil, and others
- The need to reconcile the continued need for viable returns with an increase in resource needs (especially private) post-approval to satisfy safeguards or other unforeseen requirements, for example in reclaiming land for large-scale oil & gas and tourism projects
- The difficulties of developing joint capabilities under conditions of high uncertainty and previous fragmentation, e.g., in implementing in practice co-development in orthopedic contract manufacturing, or connecting substrate providers and chip makers in LED development and production
- The difficulty of sustaining complex extension service provision (in rice or palm) when experienced agricultural labor is becoming more and more difficult to attract and retain, due to urbanization and/or changes in migration

[104] A handful of agencies (such as the MPOB and MPRC) were engaged multiple times,
[105] Specifically, short and impromptu site visits (individual) or arranged dinners (group).

- The tension in expanding pilot projects when early advertisement of the causes of success is necessary for diffusion but might alert potential opponents ahead of time of means to subvert the reforms, e.g., in reforms to teaching methods and evaluation in public schools
- The conflict between the need for openness and for protection or secrecy, such as in standard-setting (prototypically, in cyber-security)

In most sectors there was more than one engagement (and in key sectors, five to six).[106] Then the tentative conclusions from one interview were used to inform the problems posed in the next, to confirm, extend or refute the initial findings. For example, an initial interview in oil & gas found an absence of deep engagement in supplier development; this finding was recast as a long-term threat to the industry in the interview with Petronas, which disclosed a coherent strategy of first shaking the complacency created by a prior model and then moving to a new one; and verifying the status and quality of that new model then became the problem posed (obliquely) in discussion with supplier firms themselves. As another example, here of refuting an initial conclusion, initial interviews and a site visit in agriculture led to the tentative conclusion of it as a weak sector, one that was overturned (except in specific categories) on a more in-depth interrogation of the Ministry and an examination of its field manuals. This then points to the final step, namely verification against primary documents (where available), searches for contrary views (in the literature, general press or online), and any final literature reviews.

[106] Sectors with only one engagement were financial services and "communications content and infrastructure" (telecommunications). Those with the most engagements were palm oil, oil & gas, and electronics-cum-medical devices, followed by agriculture, education and tourism.

FIGURE 4: Engagements by type

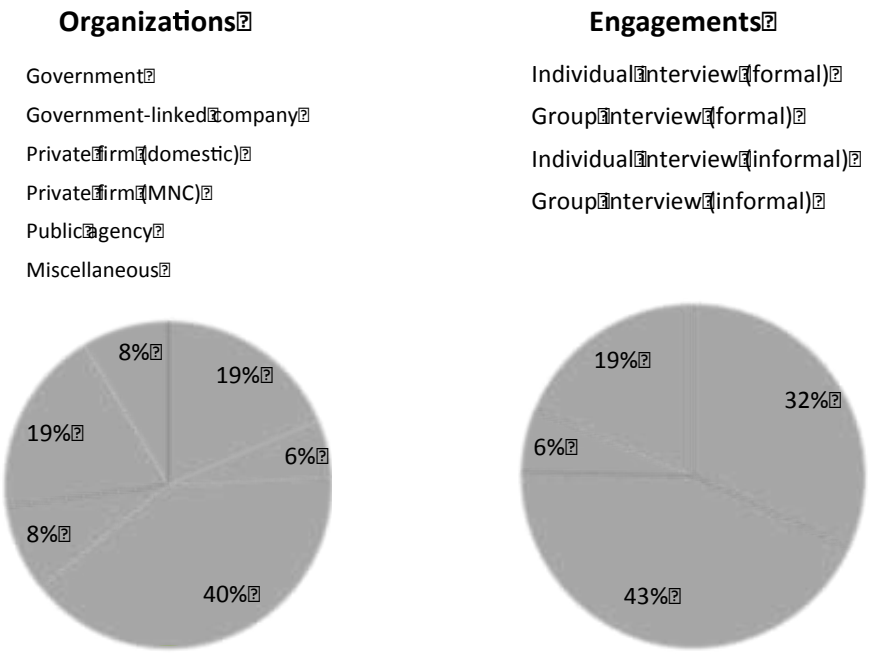


TABLE 1: List of Organizations Engaged

Organization	Type	Sector
Auditor General, Government of Malaysia	Government	Anti-corruption
DBKL (Kuala Lumpur City Hall)	Government	Municipal management
Economic Planning Unit (EPU)	Government	Expenditure planning
Medini Trust School	Government	Education
Ministry of Agriculture	Government	Agriculture
Ministry of Education	Government	Education
Ministry of Federal Lands	Government	Municipal management
Ministry of Housing and Local Government	Government	Municipal management
Ministry of International Trade and Industry (MITI)	Government	Investment Promotion
PEMANDU	Government	Central department
Police Department	Government	Crime
Shah Alam City Council	Government	Municipal management
SJKT Kangkar Pulai	Government	Education
Khazanah	Government-linked company	Cross-sector

KOJARIS	Government-linked company	Retail
Petronas	Government-linked company	Oil & gas
Sime Darby	Government-linked company	Palm oil
TalentCorp Malaysia	Government-linked company	Education
AA Edu	Private firm (domestic)	Education
ABio Orthopaedics	Private firm (domestic)	Healthcare (medical devices)
Allied Dairy	Private firm (domestic)	Agriculture (dairy)
Beaubelle Academy	Private firm (domestic)	Tourism
Berkat Setia Palm Oil Mill	Private firm (domestic)	Palm oil
Dialog	Private firm (domestic)	Oil & gas
Emery Oleochemicals	Private firm (domestic)	Palm oil
Evault	Private firm (domestic)	IT security
Hyrax Oil	Private firm (domestic)	Oil & gas
KotraPharma	Private firm (domestic)	Pharmaceuticals
Ladang Sabah Palm Oil Mill (IOI Group)	Private firm (domestic)	Palm oil
LeapED	Private firm (domestic)	Education
Marlborough College	Private firm (domestic)	Education (exports)
Melaka Gateway (Kaj Development)	Private firm (domestic)	Tourism
National Instrument	Private firm (domestic)	E&E (testing)
NV Terminals	Private firm (domestic)	Tourism
Palm oil smallholder (replanting scheme)	Private firm (domestic)	Palm oil
Palm oil smallholder (cooperative member)	Private firm (domestic)	Palm oil
Pavilion	Private firm (domestic)	Retail
Penchem	Private firm (domestic)	E&E (LEDs)
ProEight	Private firm (domestic)	Oil & gas
QAV Technologies	Private firm (domestic)	E&E (testing)
Raffles American School	Private firm (domestic)	Education (exports)
SecureMetric	Private firm (domestic)	IT security
Small shopowner	Private firm (domestic)	Retail
USAiNS Infotech	Private firm (domestic)	E&E (LEDs)
Aecom	Private firm (MNC)	Engineering & design
Bechtel	Private firm (MNC)	Engineering & design
Naton	Private firm (MNC)	Medical devices
Osram	Private firm (MNC)	E&E (LEDs)
Silterra	Private firm (MNC)	E&E
TESCO	Private firm (MNC)	Retail

Federation of Malaysian Manufacturers	Private, civil, public-private bodies	Manufacturing
Palm oil cooperative (management)	Private, civil, public-private bodies	Palm oil
PEMUDAH	Private, civil, public-private bodies	Regulatory simplification
Real Estate and Housing Developer's Association	Private, civil, public-private bodies	Real estate
Wild Asia	Private, civil, public-private bodies	Palm oil
Yayasan AMIR	Private, civil, public-private bodies	Education
AIM	Public agency	Innovation
CyberSecurity Malaysia	Public agency	IT security
Genovasi	Public agency	Innovation
InvestKL	Public agency	Investment Promotion
Iskandar Regional Development Authority	Public agency	Regional development
Johor Petroleum Development Corporation	Public agency	Regional development
KTMB	Public agency	Railway company
Malaysia Petroleum Resources Corporation (MPRC)	Public agency	Oil & gas
Malaysia Productivity Corporation	Public agency	Regulatory simplification
MIDA	Public agency	Investment Promotion
MPOB	Public agency	Palm oil
Northern Corridor Implementation Authority	Public agency	Regional development
Spilok Rehabilitation Center	Public agency	Palm oil

ANNEX B: CURRENT STATUS OF KPIS

PDF file available on request.

ANNEX C: THE "BIG RESULTS FAST" METHODOLOGY

PDF file available on request.