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AMQ International's

STRATEGIC ASSET MANAGEMENT

Better Budgeting, Better Funding
For Maintenance, Renewal and New Capital

Do you find that, despite everything we have learned in asset management, the squeaky wheel still gets most of the funds? that maintenance and renewal allocation tends to be 'whatever it was last year' +/- a bit? that the silo mentality prevents corporate wide objectives being met? Do you long to do something about it? To bring a bit more rationality into the equation? Of course you do. But what can be done? Well, this week, there is some good news on this front. Take a look at what the Hobart City is developing -

Hobart City"s Portfolio-wide, risk based, project prioritisation. (pp 2-5).

For more on the question of funding - but more especially on where the funds are going to come from - see the excellent summary by Mark Knight and Andre Ungere of the University of Waterloo. They look at the pros and cons of five existing funding methods in this, the first part of a two part article. In the next issue they will present a sixth, an innovative new funding method.

Funding Municipal Water Infrastructure: a story in two parts - Part One (pp 6-10)

Finally, from Padma Pinidiya, comes a response to an earlier question on how we could go about modelling service life cycles. Something to think about as we move into service oriented asset management. If you are given to doodling during meetings, why not take this as a starting off point and see what you can achieve?

Ideas on a Service Life Model (pp 11-12)

Enjoy!
Penny

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Preamble: Difficult but valuable.

When my last PhD student submitted her thesis (for which she subsequently won plaudits from both examiners!) I experienced what I described at the time as the academic equivalent of the 'empty nest' syndrome. In 'Strategic Asset Management' I offered that if anyone were working on something difficult that was potentially of great value to their organisation or to society, I would be happy to act as a sounding board to help them achieve their ends. I received three applications, and I chose the City of Hobart's roject to apply a total portfolio wide risk approach to project prioritisation. As far as we knew no council, at least in Australia, was using such an approach. However, TransCanada was doing similar work and were most generous in sharing their issues and findings with the Council

I particularly liked the way that the City of Hobart went about the project - with two senior experienced asset managers in ***Colin Jones*** *and* ***Andreas Hack*** *providing direction, and a group of bright, younger members in* ***Martina Smith, Frank Chen, and Bill Hanley*** *providing the creative and developmental inputs.*

Here is the result.

PORTFOLIO WIDE RISK PRIORITISATION PRIORITISATION IN THE CITY OF HOBART

THE DRIVER - the need to prioritise on a rational, consistent and transparent basis

Up until 2012, the city of Hobart had been able to fund all the renewal requests it received. In 2013 that ceased to be the case and the City had to decide which requests to fund and which not to fund, in other words it had to prioritise. Previously the procedure had been, as it is in many councils, that a decision was made on the basis of discussion between senior mangers, asset managers and service custodians. In Hobart there some 10 asset portfolios each with its own asset managers and even more service custodians. Those who were most persuasive won the day.

When decisions were made the values that drove those decisions was not recorded. Funding tended to be based more or less on last year's funding and there was little swing from year to year. This did not provide scope for funding to move to areas most in need. The Asset /Services Unit decided that they needed a way to judge the comparative benefits of projects across this multitude of asset portfolios and stakeholders. For the method to be acceptable to all in the council, it had to be transparent and non-disruptive.

THE PROJECT - Project Prioritisation based on Risk-Cost comparisons

The Unit decided that if it were possible to calculate both the consequences (the risks involved in doing or not doing the project) and the costs involved, then it should be possible to develop a project score reflective of the Consequences and Costs and to rank or prioritise projects on the basis of those that promised the most 'bang for the buck'. To do this required that all consequences, both the tangible and the intangible, be addressed. Success was to be measured against the following objective, which provided the goal, the success criteria, and the timeline.

> *"Prioritise the 2014/15 capital works projects across all asset portfolios with no significant concerns from stakeholders that the process or outcomes are too onerous, unfair or disruptive, and to develop an assessment matrix for future use."*

The Asset Services Unit wanted to develop the methodology so that it could eventually be applied to all areas of council, including the assessment and optimisation of funding requirements for maintenance, operating and capital expenditures.

Non-disruptive

In keeping with the desire to be 'non-disruptive' and to secure the cooperation of all involved, the risk prioritisation methodology was to be phased in. For the first year (the 2014/15 budget) it was applied to only 10% of the total funding. Asset Managers were allocated 90% of the total funding to prioritise projects within each portfolio using their own portfolio specific methods. This meant that all asset managers' high priority projects were funded. Lower priority projects, the ones that did not rank high enough to be included in the 90% allocation, then had a second chance to be considered during the risk prioritisation method that was applied to the remaining 10% of the budget.

The assessment of the un-funded projects, bidding for the remaining 10% of funding, was broken down into two stages; calculating the benefit or risk reduction, "Bang", and calculating the project cost, "Buck".

The "Bang" (Consequences)

The "Bang" analysis commenced with small group workshops conducted to identify and quantify the consequences (threats and opportunities) of not doing each project. For

each portfolio, the time restraints on these workshops were set at 2 hours for the first project, 1.5 for the second and 1 hour or less for subsequent ones. Consistency was achieved by the technical working group participating in all of the sessions. The data on each project was collated using an excel template. From this data a matrix was developed that categorised each consequence into typical categories, such as Financial, Service/Business Continuity, Reputation & Image, and Environment & Sustainability. Quantifying tangible and intangible consequences was achieved by this matrix, whereby each consequence was compared to each other by asking "If we could prevent only consequence 1 or consequence 2, which one would we do first?"

The "Buck" (Costs)

The "Buck" component was calculated from known or estimated information, which included project cost, changes to long term renewal lifecycle costs, expected life of the asset and other available information. Finally, the priority ranking for each project was calculated by dividing the summation of the risk scores, using consequence and likelihood, "Bang", with the project financial data "Buck", on an annualised basis.

THE CONSEQUENCES

1. Greater Understanding

Through their participation, Asset Managers began to better understand the impacts associated with projects from portfolios other than their own enabling a change from the previous "silo" culture. This was achieved by each asset manager presenting one of their projects that had been through the risk cost assessment. The final project priority ranking was accepted by Asset Managers who then presented it as an optimised program to upper management.

2. Quicker Acceptance of Program by Senior Management

As a result of the asset managers and service custodians prioritising the works program senior management accepted it in significantly less time compared to previous years.

3. Greater Efficiency and Reduction in Bias

The risk cost methodology has proven to be a powerful and efficient decision-making tool that significantly reduces bias and influence, and increases transparency and accountability. This could be applied to many areas of business in local government such as project management and risk management. The matrix is a snap-shot of the Council's priorities and can be recalibrated to align with changes to customer demands and the political climate.

4. City of Hobart to continue to phase in the risk cost methodology

City of Hobart are continuing with the Risk Cost methodology and increasing the number of projects in each portfolio that will be scored through the new methodology.

Bill Hanley, who presented the Unit's work to the IPWEA Sustainability Conference last month, is happy to speak to anyone interested in applying this methodology .He can be contacted at (03) 6238 2902 or at hanleyb@hobartcity.com.au Here are the questions he fielded, and his answers.

Q1: Has other criteria been assessed/used other than the Risk Quantification process?

A: Yes, each Asset Manager was given 90% of their asset renewal funding (which was calculated from averaging their forecasted 5 year asset renewal requirement) and used their own priority assessment to priorities their projects.

Each asset manager allocated the 90% of funding to each of their projects from highest priority to lowest until the funds were depleted. The lowest priority projects that did not get funding were then grouped together (with the other portfolios lowest priority projects) to bid for the remaining 10% of funds.

The total asset renewal funds available for all portfolios was approx. $20m. The buildings portfolio 5 year averaged forecast asset renewal requirement was approx. $2m. Thus, the 90% funding allocation for buildings was $1.8m. I used a method involving building hierarchy and a split of the projects between 'renewal', 'upgrade' and 'new' to prioritise my 90%, and 3 projects were unable to be funded, but these were the lowest priority.

These 3 unfunded projects then went into the Rick Quantification process to bid for part of the available $2m (10% of the total asset renewal funding for all portfolios).

Q2: How do you assess project characteristics such as innovation and ingenuity?

A: Why have innovation for innovations sake? There must be a reason. We can identify the following elements that drive innovation and how they're assessed in the risk quantification method:

- Up front capital costs – lower costs benefit the score.
- Changes to operational and maintenance costs – lower costs benefit the score.
- Changes to long term renewal demands (LTRD)– expansion, upgrades and new assets increase the LTRD, thus avoiding these will benefit the score.
- Financing options – opportunity costs are assessed when borrowing money.
- The life of the project – longer project lives benefit the score, thus taking into account service delivery planning.
- Consequences of the project – the more negative consequences avoided, or positive consequences realised, the better the score.

Q3: How does the approach address political impacts?

A: I can think of two possible ways that this method addresses political impacts:

1. Political impacts from doing projects: In the matrix there is a category for political consequences. This can encompass anything relevant to political consequences. These are assessed the same as other consequences in other categories.

2. Out of nowhere a politician will announce a new project (politically driven): This new project might be considered a 'must do' even though there has been no allowance for funding. So, the lowest priority projects will drop off the list and the new politically driven project will utilise their funding. The good thing about the risk quantification method is that it can provide feedback to the politicians by showing them what projects will have to make way for their project and what the consequences are if they choose to go through with their project.

Funding Municipal Water Infrastructure: a story in two parts - Pt 1.

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Many water utilities are faced with the problem of rising operation costs, aging and deteriorating infrastructure, and the need for more funds required to fix and replace the leaky, broken, pipes, valve, plants etc. In part one of this paper, the authors consider five existing funding options and in part two, they present an innovative proposal for a sixth option that involves private sector financing not simply for individual projects but for entire infrastructure programs.

Figure 1: Replacement value percentages for urban infrastructure

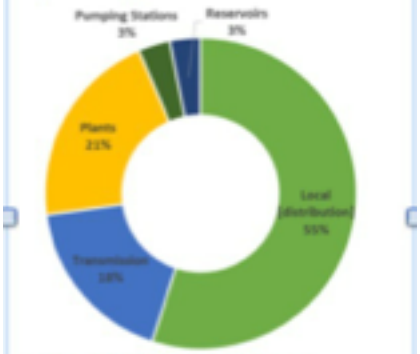

Figure 2: Replacement value of drinking water systems

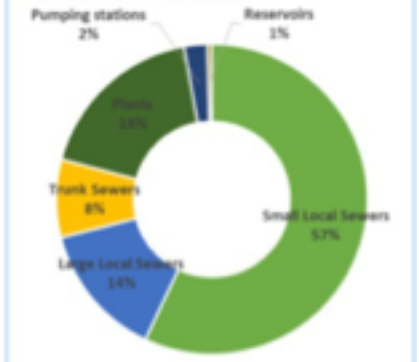

Figure 3: Replacement cost of wastewater collection networks

Part One: Funding Infrastructure, the current situation

In 2012 the Federation of Canadian Municipalities (FCM) released Canada's first infrastructure report card. This report card provides replacement values or water and wastewater infrastructure. Figure 1 shows that water and wastewater make up 55% of all urban infrastructure replacement value while roads are only 32%. Figures 2 and 3 show replacement values for water and wastewater infrastructure respectively. These figures show that water and wastewater transmission pipelines make up 73 and 71% to the replacement value respectively with plants representing 21 to 18%, pumping stations 3 to 2% and reservoirs about 3 to 1%. Thus, water infrastructure pipelines represent over 70 percent of the asset. Considering that much of the water pipe distribution network has reached, or will be reaching, its useful life over the next couple of decades, a large effort and costs will be needed to assess, renew and replace these critical pipes.

Let's look at the possible options to reduce and/or eliminate the critical problem facing all developed nations.

Option 1: Do nothing.

Fortunately, water pipeline performance has been exceptional with many old pipes still working well. Deteriorated pipes will result in increased failure rates (i.e. watermain breaks, surcharging, backups, sinkhole formation, etc.) that often result in sudden and immediate unplanned repairs that cost multiple times more than planned Capital works projects. Aged and

deteriorated pipes can also significantly increase network costs over time. These increases in operation costs may not be immediately evident, as water slowly leaks out of water pipes or ground water flows into leaky cracked sewer pipes. Increased need for water treatment can often drive the construction of larger water and wastewater treatment plants.

Water infrastructure is often forgotten and ignored for the following reasons. 1) Pipes are out-of-sight and out-of mind especially when compared to roads. 2) Pipes have a significant slower deterioration rate than roads: they have service lives that are 80 to 100 years when roads are 20 to30 years. 3) Pipe condition evaluation is much more difficult and costly than that for roads. 4) The public has an expectation that clean safe water will be delivered and wastewater will magically disappear.

For these reasons the do nothing approach has been taken in the past, or funding has been cut when budgets get tight. With increased pipe age and deterioration, an increased number of high profile failures, increased regulation and legislation as well as increased requirements for industry accountability, the do nothing strategy is no longer either feasible or acceptable.

Option 2: Government grant programs.

Over the years many studies have been published that highlight the size and magnitude of the infrastructure backlog or deficit for all types of infrastructure – water, roads, bridges, parks, etc. The size of the funding gap is enormous. Considering the federal and state/provincial government's current deficits, limited finances, and lack of wiliness to increase taxes, it is highly improbable that they will provide the funding to municipal governments and their associated water utilities needed to deal with the problem. Instead, federal/state/provincial governments have passed legislation that force water utilities to better manage their systems themselves and to ensure their own long-term financial sustainability. For example, in New Zealand, the Local Government Act 2002 Amendment Bill (No 3) now requires councils to prepare an infrastructure strategy for at least a 30 year period and to incorporate this into their long-term plans for 2015. In Ontario, Canada the Water Opportunities and Water Conservation Act (2010) reiterates the requirement for financial sustainability plans for water and wastewater systems. In addition, it requires preparation of an asset management plan for physical infrastructure, a water conservation plan, and a risk assessment and mitigation plan. In 2002 the Ontario Sustainable Water and Sewage Systems Act required water utilities to be financially sustainable through full cost pricing, and established reporting requirements for utilities to include full cost of service, infrastructure management plans, and cost recovery reports. Research has shown that the expectation of grants may motivate municipalities to avoid investing their own resources in maintenance of the infrastructure assets.

A key attraction of the grant funding approach is that it allows municipalities to conduct business as usual. In other words, the municipal governments use their resources to specify the design of the water infrastructure asset as part of a tender. The municipality then tenders the contract to local construction companies with the least cost bid typically wining the contract. The contractor purchases a performance bond to guarantee that their work is completed on time and budget subject to design specifications. Complex projects requiring multiple staged tenders are often managed by the municipality. Beyond their own due diligence and good faith, staff within municipalities have little economic incentive to minimise risk and resulting cost overruns inherent in their management of these complex projects.

These costs are instead borne by residents though the tax base and user fees. In summary, the pros and cons of government loan programs are: low cost of borrowing, few restrictions on the availability and timing of loans, and no cap on project delays or cost over-runs.

Considering that water infrastructure is to be financially sustainable (i.e. revenues must equal expenses over the short- and long-term planning horizons), relying on increasingly doubtful federal/state/provincial grants to subsidise the water distribution business is no longer feasible.

Option 3: Pay-as-you-go, capital reserving, and borrowing.

As stated earlier many governments have enacted regulations that will force water utilities to be financially sustainable and to develop sustainability plans. To meet these requirements using the pay-as-you-go option (where revenues and expenditures must balance on an annual basis), water rates will need to be increased significantly (at up to 9% per annum) to generate sufficient revenue for the development of capital work programs. It is well recognised that increasing water rates can reduce revenue over time due to a reduction in demand, and this, in turn, forces further rate increase. This is known as the price elasticity of demand. Research completed at the University of Waterloo has shown that the price elasticity of demand will have a major impact on the rates required to sustain the system. It shows that there is a lower limit below which consumers are no longer able to reduce their water demand to keep their water bills low. This then creates affordability hardship issues for residents.

Capital reserving is an attractive strategy for municipalities to create a “nest egg” during times when the water infrastructure expenses are low, which then allows them to increase spending on infrastructure backlogs with minimal increases in the water rate. Unfortunately, defending this pot of money is often a difficult proposition for water service departments within municipalities when councils are faced with multiple competing expenses. Consequently, pay-as-you-go becomes the mantra for these same water service departments to meet their short and long term funding needs. Unfortunately, the scale of the necessary investment can create rapid increases in the water rate, putting strain on the residents, and testing the political will of councils to approve the fee increases.

In Ontario, Canada, water utilities can borrow up to 25 percent of their revenue on an annual basis. This is facilitated through the traditional municipal bond market. Two factors impede the necessary scale of bond issuance to meet the infrastructure investment that is required. First, debt issued by a municipality to fund expenses within the water services department becomes part of the overall debt profile of the municipality and may yield an unfavourable bond rating and resulting interest rate even though the ability of residents to pay their water bills is secure. Second, disclosure of consumer, engineering, and financial information regarding the water services department’s distribution business to investors is not standardised in the Canadian bond market. This makes these financial instruments difficult to price and highly illiquid relative to federal and even provincial bonds, and consequently poor investment opportunities for investors that frequently need to monetise their portfolios.

Whether the municipality chooses pay-as-you-go, capital reserving, or borrowing, the key attraction is that management of the water infrastructure system remains business as usual. Relative to government loans, the municipality will have to pay a higher interest rate on borrowed capital. To attract purchasers of the municipal bonds and hence timely arrival of

capital, a bond insurer may be used to cover some of the default risk at an addition premium. However, business as usual still implies cost overruns are borne by residents though the tax base and user fees. Furthermore, the issue that there is no cap on project delays or cost over-runs remains (PPP)

Option 4: Private public partnerships (PPP).

Private Public partnerships in the water sector have been used successfully for the building and subsequent operation of wastewater treatment plants. The typical implementation strategy involves creating a special purpose vehicle (SPV) to oversee the project. The SPV purchases a letter of credit from a bank to reasonably minimise default risk for its capital market investors and to receive timely capital. It also purchases a performance bond to guarantee a standard of service to the municipality. The SPV then collects water fees from the residents to cover capital and operation expenses associated with managing the infrastructure system, as well as repaying the capital market investors. The performance bond strongly motivates the SPV to minimise all risks and resulting cost overruns over the term of its management contract. Furthermore, the no default guarantee ensures that borrowed funds used to capitalise the SPV require a higher interest rate premium relative to either municipal bonds or government loans. However, there is now a cap on project delays and cost overruns. The resulting net lifecycle cost of project to the municipality and its residents could easily be less expensive than either the government loan or municipal bond approach.

Despite the obvious benefits of the PPP approach, they have received little attention as a strategy to manage water treatment, water and wastewater distribution, and otherwise to develop multi-year network renovation/renewal programs for water infrastructure. Perhaps the mitigating factor is the municipalities' loss of control in overseeing the water infrastructure system, and their ability to act on the residents' best interests over the term of the PPP management contract. Another considerable issue is the liability associated with distributing potable water to residents, and the margin the SPV would have to retain to cover this risk. Finally, many water distributions assets are located in public right-of-ways creating conflicts between the PPP and the municipalities' management of other assets such as roads.

Option 5: Privatisation

The United Kingdom has privatised the water networks with some success. Privatisation of water systems in Canada is unlikely for the following reasons: 1) Water is deemed a public good and access to potable water is considered a societal privilege, 2) water utilities are generally well managed, and 3) the probability of political fallout from privatisation is very high due to public sentiment on the issue as well as from lobbying by established and organised environmental groups. Similar issues also apply in the USA, Australia and New Zealand.

In part 2 the authors propose a new method for matching the long term borrowing requirements of water utilities with the appetite for capital market investors to purchase low risk instruments that yield a greater return than the traditional 'risk free' federal bonds. In effect this new method is a solution to alleviate the infrastructure backlog, one that maximises transparency in water infrastructure as an investment opportunity, re-investing accumulated wealth from the markets back into the public's service.

SERVICE LIFE MODELLING BY PADMA PINIDIYA

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If asset management is now about service, rather than assets, should we not be developing life cycle "service' models?

It is well understood that assets exist for a purpose and, that the purpose is 'service' - to cater for the needs. Assessing the needs or the service levels (may it be of customers, shareholders or regulators) has been at the core of asset management. The focus, however, has been more concentrated on the life cycle management of assets – i.e. asset management is commonly defined as managing the life cycle to deliver the service, at the least cost and at an acceptable risk to the above stakeholders. Many of the key performance indicators have been designed around the asset's performance rather than the service's performance. In this focused process, some asset managers lost the touch with true "need specification" and sometimes provided services with exceptional quality to which customers had no value attached.

This might be in the form of lower than expected risk or higher than expected product quality. The customers were not offered a choice to select the service that provides value for them, rather were given what the water authority or the regulator believed was good. Need for service is predominantly annotated with asset performance which relates only to a part of the whole customer experience which I trust defines the "service". In my view, the product life cycle (PLC) is the best place to start the service life cycle (SLC) discussion. I believe SLC is guided by the PLC (stages of service life) and customer experience life cycle.

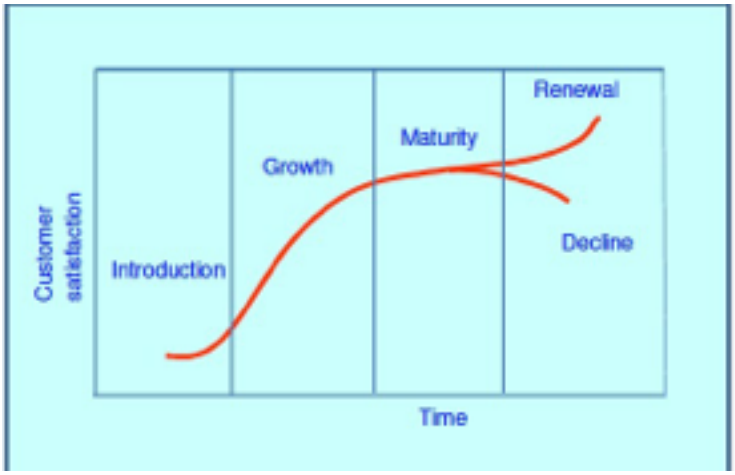

Figure - 1: Product Life Cycle
The Product Life Cycle (PLC) is used to map the lifespan of a product. There are generally four stages in the life of a product - introduction, growth, maturity and the decline stage.
Figure 1 illustrates the four stages of the PLC – how the sales volume changes as the product passes through the each phase.

Analogue

- Sales -> customer satisfaction with the service we provide.
- Product -> **Service** we provide that encompasses wholesome customer experience

(I think we can sum it up by the famous 4Ps (Product, Place, Price, and Promotion). In other words they characterise the service).

For example – The service to collect wastewater from homes via an individual property connection at a price of $xxx per annum per household. That $xxx include cost to provide a certain level of asset performance to limit service disruption, manage response time and also to provide a certain level of after sales/customer service. We may be able to provide a superior service at a higher $). There can be a range of “services” with a variation to any of the 4Ps. In tough economic times the customer satisfaction may drop if the cost is higher and, then “that particular service” may start to go through the “decline” phase of life cycle.

Customer experience life cycle and service provision life cycle

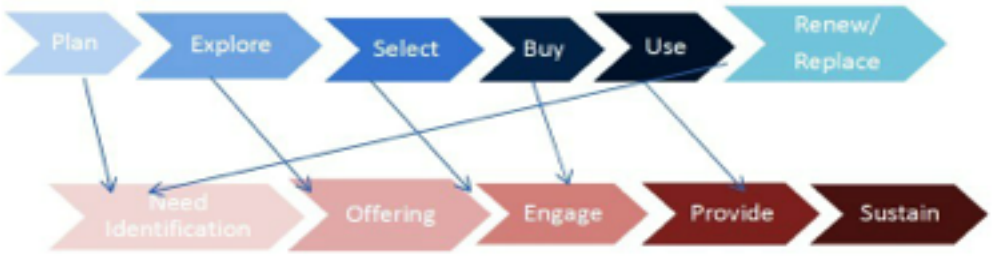

Figure – 2: Customer experience life cycle and service provision life cycle

The customer experience life cycle (Figure 2) explains the stages a customer go through in a buy/don’t but decision. The services designed to appeal to the needs of the customers have to be visible and accessible within the period of this life span. There is no one-to-one relationship with the two models. The relationship is more apparent for commodity type products and services.

Issues for organisations

• How a service is defined. Sometimes they are integrated and difficult to separate
• What could be the turnaround time for a service provided by a water utility
• How can we manage the service life cycle proactively
• How do we know what stage is it at a given time
• Customers’ needs and demands change; and are influenced by many things like social, economic and technological change
• How do we define and measure customer satisfaction. Often it is easier to define factors of dissatisfaction. What could be other indicators
• The assets are long lived. The investment decision we make today take a longer term view and difficult to reverse. Under such circumstances is the service redesign in the form of other 3Ps
• Some standalone services can come to an end. But if competition comes into play, for the long term services, the goal has to be making the switching cost significant. The responsibility lies within the whole organisation. This may require redefining of organisation models, their missions etc
• How well the customer experience model and service provision model be applied to organisations which operate in regulated monopoly environment and, to their services mainly viewed as essential
• If customer satisfaction and the decision to buy/reject depend on the value they attach to the service, how do we know it? how is it defined?