these retail services, there is a dependency which runs the other way, i.e. from retail services back to subscribers. Figure 4.2 below shows this value chain.

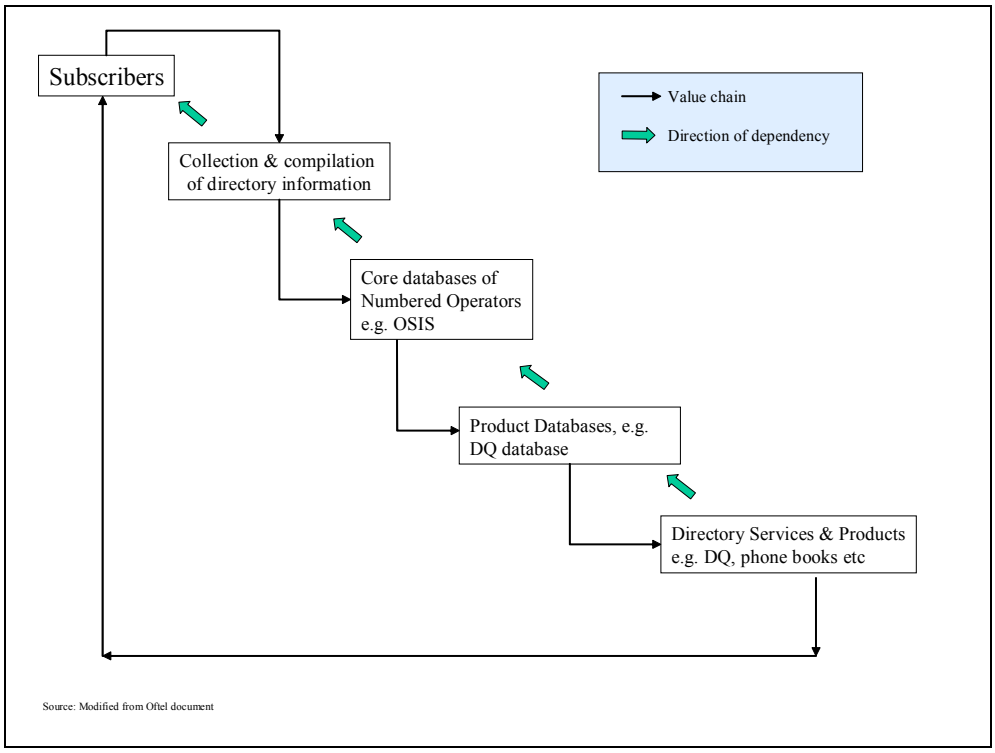

Figure 4.2: Value chain for Directory Services

The value chain provides some information as to the complex economic and public policy issues involved in the liberalisation of directory information services. It is currently intended to address these issues in a separate consultation that will explore fully the definition of the relevant market and the assessment of market power. Hence, while the TRA does not seek to resolve these in this present consultation, it does wish to draw attention to the need for Batelco and other licensees to recognise a range of issues some of which can make liberalisation of DQ information more difficult if they are not addressed early on. These include:

- issues associated with data privacy;
- the means of exchange of information between operators;
- the right of subscribers to withhold information from publication;
- the continued provision of consolidated printed directories in Bahrain;
- payment for the provision of the services by Batelco; and

- the possible provision of directory services by third party organisations.[1]

In the short to medium term Batelco is the only entity able to provide directory information services and products from its own directory information database; third party provision is not a practical alternative at this point.

This suggests that Batelco would be considered dominant in the provision of these products and services, and accordingly, the TRA intends to require the following:

1. Batelco to extend the provision of DQ services, including international DQ services, to the subscribers of other networks. This will involve Batelco billing Other Licensed Operators (OLOs) and the various licensed business streams within its own overall entity for DQ calls made by their subscribers. The price of this service to OLOs should be discounted according to the cost savings for Batelco of these calls, compared to calls from Batelco's own subscribers.
2. Batelco to offer each OLO the option of having its directory information included in a unified Bahraini DQ database.
3. Batelco to offer all mobile operator's customers including those of competitors the option of having their mobile number listed with their fixed number, in a unified Bahraini telephone directory, as Batelco does presently for its own customers.

The TRA considers that Access to these directory information services and products should be included within Batelco's RAO.

The TRA does not consider it necessary to determine whether printed directories are in the same market as DQ services or CD-ROM directories at this stage, as Batelco is presently and practically the only operator able to provide these services.

Consultation:

The TRA wishes to hear from interested parties regarding the proposals for DQ and related services, as set out above.

3.3 Emergency call services

Under the terms of their licences, all fixed and mobile operators are required to offer their customers access to the emergency services. It is obvious that this is a specific market requirement as an ancillary call service to the provision of public telephone services over fixed or mobile networks for which there are no substitutes.

In the Consultation documents on interconnection, the TRA proposed that in regard to emergency services, Batelco should provide other appropriately licensed operators with interconnection and carriage across its fixed network of emergency calls and the technical features required in order to provide access to emergency call processing facilities. Batelco has agreed to this in its submission to the TRA during the consultation on 'Dominance in Interconnection Markets' and the TRA, therefore, requires Batelco to include in its RO, details of its emergency services access offer. These services will be charged on a forward-looking long-run average incremental cost

[1] Included within this point are: directory database interface issues which enable cost effective exchange of information between licensees, and the provision of call completion without number disclosure

(LRAIC) basis, plus an allocation of common costs in proportion to their relative incremental costs using equal mark-ups.

4 Other services

In addition to services identified in the previous determination related to interconnection markets, there are a number of services and facilities to which other licensed operators, and the separately licensed business units of Batelco, may require Access. With the licensing of ISP and VAS providers and the establishment of the BIX, the new entrant service providers may request that Batelco provides a range of services that are necessary for the operation of their businesses. In some of these service markets, Batelco may be deemed to have a dominant position, which raises implications for the provision of these services.

Services that might be sought include, but are not limited to:

1. Leased lines – national and international;
2. Switched data services;
3. Fixed-to-fixed call origination for dial-up ISP services; or narrowband Internet services;
4. Mobile to fixed call origination for dial-up to ISP services;
5. Broadband internet services;
6. Connectivity between ISP points of presence (POP) and the BIX;
7. Connectivity between ISP points of presence (POP) and the Internet connectivity services supplied by Batelco (the ISL or IFL licensee);
8. Connectivity between BIX and the ISL or IFL licensee of Batelco in Bahrain;
9. International Internet connectivity;
10. Collocation or other forms of facilities sharing (e.g. duct, building);
11. Access to specified network elements or facilities, including, but not limited to unbundled local metallic path and line sharing;
12. Access to technical interfaces, protocols or other key technologies that facilitate the interoperability of services that relate to the relevant market;
13. Access to specified services required to ensure interoperability with users, of end-to-end services relating to that market, and which other licensees can not reasonably be expected to self provide;
14. Access to operational support systems or similar software systems that are needed to enable fair competition in the provision of services relating to that market;
15. Domain name services; and

and areas in which there is a concentration of high value end-user businesses (i.e. in central business districts), there will be little competition in the foreseeable future for the provision of leased lines. Moreover, in parts of countries where competition in the provision of leased lines has developed, such competition has mainly arisen at relatively high bandwidths, typically above 2Mbps, which is the highest bandwidth presently offered by Batelco. Entities wanting more leased line bandwidth than 2Mbps from Batelco have to buy it in multiples of 2Mbps.

This evidence suggests that while some competition may evolve in the provision of fixed leased lines in Bahrain, it is likely to be limited to:

- relatively small areas within business districts that are disproportionately populated with organisations that have very high demand for telecommunications services, and
- connections between such districts.

The TRA expects that demand for PPCs would materialise following full liberalisation in mid 2004, however, there are several areas that are presently liberalised, and the TRA expects new entrants in these areas to be buyers of of leased lines from Batelco.

Of principal concern to the TRA at this stage of liberalisation are leased lines that connect licensees, and leased lines that connect end users, as will be required by OLOs, ISPs, VAS providers, and possibly by the BIX.

ISPs may require leased lines in order to transport traffic to and from Batelco's local office and their own premises. ISPs may also need leased lines to connect to managed facilities providers, such as a data centre hosting company. ISPs will need leased lines to carry traffic from their own premises to the BIX in order to obtain national and possibly international Internet connectivity. If ISPs choose to buy international Internet connectivity from Batelco, they will need leased lines in order to connect to the appropriate level in Batelco's network. The BIX is also likely to need leased lines in order to connect to Batelco and obtain international Internet connectivity, an issue we

or supply chain is dominated by one operator that can impede others, for example through denial of connection, pricing conditions or other means. It is most often the case that lack of competition at the retail level can be most satisfactorily rectified by regulatory action to remedy the upstream problem.

In the case of Bahrain, it is not possible at this stage to define more than one wholesale (i.e. upstream) product market. Batelco currently offers leased lines in 12 bandwidths: 9.6Kbps; 14.4Kbps; 19.2Kbps; 64Kbps; 128Kbps; 256Kbps; 384Kbps; 512Kbps; 768Kbps; 1Mbps; 1.5Mbps, and 2Mbps. These would appear to form a chain of substitutes such that all bandwidths would be included in the market definition for national leased lines. Higher bandwidths will likely be in demand and, following liberalisation in July 2004, it is possible that competitive conditions will develop in certain urban areas, although such competition may be limited to bandwidths above 2Mbps. It is possible that the competitive conditions for the provision of higher bandwidth leased lines in certain areas of Bahrain may become sufficiently different for more than one leased line product market to exist in Bahrain. However, at present, the TRA considers the product market to comprise all leased line bandwidths.

A similar range of 10 bandwidths, i.e. 9.6Kbps; 19.2Kbps; 64Kbps; 128Kbps; 256Kbps; 512Kbps; 768Kbps; 1Mbps; 1.5Mbps, and 2Mbps is available for international leased lines from Bahrain. Again these would appear to form a chain of substitutes such that that TRA considers they would be included in a single relevant product market for international leased lines.

It is worth noting that the same bandwidth considerations relating to the wholesale product market for leased lines also apply to the retail market for leased lines. Thus the TRA also considers there to be a single product market for all bandwidths of retail leased lines.

In order to define a geographic scope of the relevant markets for wholesale leased lines and retail leased lines which is less than the whole of Bahrain, there would need to be, amongst other things, distinctly different prevailing supply or demand conditions and a lack of chain substitution connecting certain areas. This situation may or may not

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A related issue concerns the need for buyers of leased lines who want more than 2Mbit/s, having to aggregate 2Mbit/s capacity as Batelco does not provide the technology that enables higher bandwidth leased lines to be provided. This means that buyers of multiple 2Mbit/s leased lines are missing out on the large savings available in other jurisdictions when higher bandwidths ar

damage to competition has been done, and in a newly liberalised environment, it may make new entrants less inclined to invest.

In regard to retail leased line prices, these are only relevant to this Consultation to the extent that licensees may pay according to retail minus pricing. The types of leased lines addressed here are not sold as retail services.

The TRA has already noted its preference for not regulating retail markets where wholesale (or upstream) market regulation would bring competitive pressure to retail markets.

It is intended, however, to include retail leased lines within a basket of retail price-controlled services as a consequence of their potential contribution to cross subsidies that fund Batelco's access deficit.

For reasons discussed above, the TRA believes the third option would at best only partially solve the problem. In the mean time the TRA must address the problem, most especially for the OLOs, ISPs, the BIX and VAS providers. Hence the TRA requires wholesale leased lines to be included in Batelco's Reference Access Offer.

Leased lines to be included in Reference Access Offer

Presently Batelco's leased line offer is designed for its end-user customers. There are likely to be technical and cost-related differences between this form of leased line and those required by the OLOs, ISPs, the BIX, and VAS providers. For these licensees Batelco will need to prepare wholesale leased line offerings that will fulfil the needs of these entities. The TRA's intention is to require Batelco to include wholesale leased line offerings in the Reference Access Offer.

Consultation

The TRA seeks respondents' views on the definition of wholesale leased line markets and the proposals for inclusion of wholesale leased lines in Batelco's Reference Access Offer.

4.2 Switched data services

It can be envisaged that VAS licensees, and potentially ISPs, may wish to use the switched data services (SDS) established in Bahrain as components or supporting functionality in the services they offer their end customers.[7] Switched or on-demand data services, with potentially variable capacity, are not a satisfactory substitute for wholesale leased lines and as such may form a separate relevant market. SDSs tend to address different demand characteristics centred around variable bit rates and more "bursty" or intermittent use of data services by the customer.

- Leased line access to Internet services.

There are a number of access platforms that could potentially be used by end-users to access ISPs. These include: PSTN and ISDN dial-up, fixed wireless access technologies (FWA), cable networks, ADSL, and fibre and satellite. The bandwidths of these options vary widely.[8] There is no obvious break in the chain of substitutes in the bandwidths these platforms can provide. At present, Batelco is providing access to ISP services through both dial-up and an ADSL service (Speednet). From a demand side perspective, it is apparent that Batelco's retail ADSL service is currently a substitute for dial-up Internet services, as it represents a trade-off between access speed and price, but it is the strength of this substitution on the margin that will determine whether these different services are in the same product market or not.

From a supply side perspective new entrant ISPs may seek to offer a dial up services, but are likely, in common with Internet access services offered in many other markets, to seek to offer higher bandwidth or broadband Internet access and take advantage of the availability of DSL services and the current level of retail pricing. Suppliers may therefore view the market as a broadband opportunity but with the provision narrowband services only as a substitute where broadband is not available. Hence, from a herepe of

In the cases of the other types of connectivity that ISPs and the BIX might require within Bahrain to connect POPs etc., it is expected that this would be achieved using

d) An alternative may be for the BIX to buy throughput (e.g. on a bits per month basis) on Batelco's international switched data service (probably ATM) with which it can send and receive its own international Internet traffic. For incoming datagrams, Bahraini addresses that are not for Batelco's own customers would be sent to the BIX. For outgoing datagrams, these would be counted as they were received onto the Batelco's ATM service.

The degree to which these services can in practice be substitutes for each other, in conditions that will prevail in Bahrain, is not yet clear to the TRA. Further information will be needed before market definitions can be determined. Clearly, the pricing of the alternatives that would allow the BIX to negotiate own transit contracts outside Bahrain or buy international connectivity from Batelco, is important in coming to an understanding about their substitutability. The TRA notes, however, that while there are necessary components that are not controlled by Batelco (e.g. foreign half circuits needed to provide end-to-end leased lines),

the TRA to understand Batelco's Internet related costs in detail, a potentially complex and lengthy task. Moreover, since the regulatory situation is likely to change in 2004, the TRA's view is that such an approach may not be appropriate. The TRA favours the solution that requires Batelco to provide non-discriminatory wholesale Access to Internet transit services. Given that Batelco's exclusivity as the provider of international transit services will end in July 2004, the TRA considers that a requirement for Batelco:

CONSULTATION

Dominance in certain markets and the provision of Access services

Ref,: ERU/CN/014

5 Proposed dominance of Batelco and the provision of access

5.1 Determination of dominance in relevant markets

The TRA has identified a number of wholesale product markets r5 berwha4(m)8(r4 771(e)f(l4 776(a)f(

- **National and International Leased Lines**

  Presently Batelco's leased line offer is designed for its end-user customers. There are likely to be technical and cost related differences between this form of leased line and those required by the other licensed operators. Batelco needs to prepare a leased line offering that will fulfil the needs of the various types of licensee that may seek to utilise Batelco leased lines.

- **Switched data services**

  Batelco should include SDS services within a RAO. The scope of services offered and terms and conditions applicable must not be less advantageous than those provided under the proposed separated accounting arrangements to Batelco's downstream services. Technical aspects of the RAO should be sufficiently flexible to meet the different requirements of new entrants who may demand SDS services.

- **Access for end-user ISPs**

  Batelco is required to provide a wholesale DSL offer.

  In addition, Access by ISPs to Batelc

6 Review

There may be services other than those identified in this document to which licensees such as OLOs, the SMO, the BIX, ISPs and VAS providers may require Access. Any such services should be brought to the attention of the TRA. It may be the case that Batelco will voluntarily provide Access to such services. However, if this is not the case, and if Batelco is found to have dominance in the provision of such services and other licensee(s) can show sufficient cause to have Access to such services mandated, then the TRA will consider their inclusion in revised Reference Access Offers from Batelco.

In a national telecommunications sector, such as Bahrain, that is expected to be subject to considerable development and change over the short to medium term, it is appropriate to review market analyses and the determination of market power on a regular basis. This will help to determine how competition is developing and assist the TRA providing effectively regulator for the sector, so as to meet the overall objectives of choice, quality and value in telecommunications services for end-users in Bahrain.

The TRA proposes to commence a review of the relevant markets identified in this consultation, and any other relevant markets that may be brought to the TRA's attention, in relation to the provision of access within a year of full liberalisation of the telecommunications sector in Bahrain. Accordingly, it is proposed that a review the markets and determination of market power and the requirements for the provision of Access is commenced at the beginning of 2005.

Consultation

The TRA seeks respondents' views on the proposals for review of the relevant markets in relation to the provision of Access services.

CONSULTATION

Dominance in certain markets and the provision of Access services

Ref: ERU/CN/014

A2.2 International price comparisons

A comparison of retail leased line prices in Bahrain with international benchmarks is included as it provides a reference point against which any proposed wholesale charges may be considered.

There are many difficulties involved in comparing retail leased line prices in different countrved12 Tw(of invol)05.58hes consertncompari-5.46(abTJ17.452460 TD0.0008 Tc0.0007 Tw(Til

The TRA's view is that average leased line lengths in Bahrain will be less than 10 Km and probably less than 5 Km. Many countries for which a comparison of leased lines prices can be made, usually provide pricing data for two distance points; 2Km and 50Km. The comparison with Batelco should not be with the 50 Km leased line prices, but with the 2 Km prices adjusted upward by approximately 10% to 20% of the difference between the 2 Km and 50 Km prices.

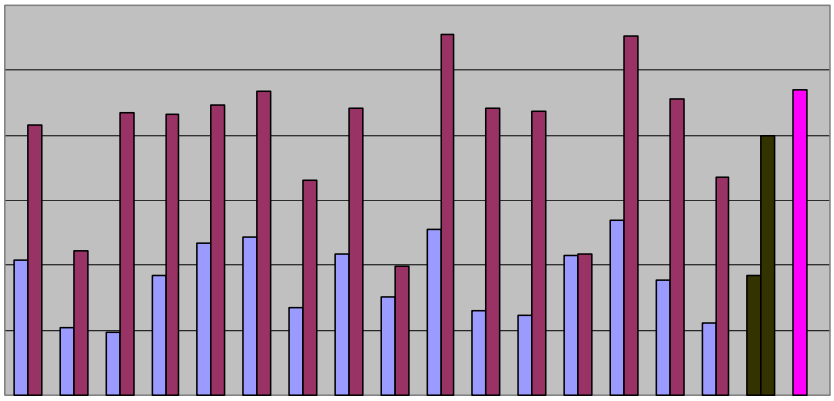

Figure A.1.2: 2Mbps Leased Lines

What should also be noted is that in the foreign countries shown in Figures A1.1 and A1.2, discounts are very common, and these are not shown in the Figures. A full comparison of the actual prices charged to consumers would require us to know the distribution of prices actually charged to leased line customers, data that is not available.

Publicly available information on the range of discounts offered is very limited./