IT Training and
Professional Development

BCS Practitioner Certificate in Enterprise and Solution Architecture

Case Study

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1. Setting the Scene

1.1 You…

You are an architect working for the International Consultants Company (ICC) on a proposal to build the "ACKO-from-Home" Home Shopping system.

The proposal will focus on the solution's Order Management System (OMS), including the definition of the solution's infrastructure.

The Project Manager was prepared to wait for you to finish a prior engagement, so that you could join the proposal team shortly after the Project Definition Workshop with the customer. Several key interviews have already been conducted with ACKO personnel, and some general information about ACKO's Information Technology (IT) infrastructure is available.

1.2 The Client…

ACKO was established 30 years ago when a loose federation of independent businesses came together to form a single trading company with 50 stores, mostly in the north of the country.

Since then, ACKO has competed successfully and now has over 100 high street stores in major cities. They have, however, remained within the country, although there is a programme underway to open flagship stores in key cities abroad.

ACKO have built their business and reputation on price and quality. They offer a slightly narrower range of goods than their competitors, limiting themselves to furniture, white goods (such as washing machines and fridges), domestic electrical goods and other household appliances.

They typically adopt a short-term approach to business development, and usually look to "low cost" suppliers. They have a patchy record on adopting strategic projects – but are beginning to recognise that the world is changing radically, and that they need to change their retail approach.

1.3 and the marketplace…

The household retail goods market is very competitive, with all the major players striving to be "number 1" through constant differentiation, while simultaneously trying to offer the same range of goods as their competitors. Currently, most high street shops are focusing on winning new and retaining existing customers through two key mechanisms:

- loyalty schemes ("spend and save")
- new sales channels (such as "store-in-store" and "home shopping" via telephone or PC based ordering).

ACKO has provided customers with an extensive catalogue of products and services for some years now. Last year, the catalogue was made available for the first time on the web, but currently the customer can only order goods from this catalogue by telephone between 08:00 and 18:00 from ACKO's Head Office.

ACKO also offers complementary services in their catalogue. When customers place an order, they are offered partner firms' services such as installation and servicing.

Now they see a major opportunity through new sales channels to win new customers abroad or in parts of the country where they are not represented by stores.

2 Notes from the Project Definition Workshop

From: ICC Project Manager

Welcome to "ACKO-from-Home"! In order to start your involvement with the proposal team, I've gathered some basic information. It's mostly from the documentation we put together during and after the project definition workshop we ran last week. In addition, I'm including some separate documents I think you'll find useful.

2.1 Why? (Business Purpose)

ACKO have a number of business imperatives that they believe home shopping will greatly contribute to:

- It will provide a cost-effective way of reaching new customers, particularly in parts of the country where ACKO do not have many stores;
- It will enable ACKO to offer a wider range of goods than they can offer in-store;
- ACKO expect the home shopping "experience" to be as distinctly "ACKO" as their stores and that all channels will remain synchronised whenever a change in branding is made by a supplier.
- ACKO expect to build a stronger relationship with their customers by getting more information about them to use for target marketing initiatives.
- ACKO expect to reduce costs by increasing internet customer services and reducing enquiries over the telephone.

2.2 What? (Scope)

ACKO believe a significant differentiation in the home shopping" sector is the ability to offer a single ACKO-from-Home service over the following "channels":

- **Telephone Call Centre** – Customers will be able to collect a paper "catalogue" of available goods from ACKO stores, or request one by post. They will then be able to use these physical catalogues to place orders by telephone.
- **On line internet** – Customers will be able to browse and order on-line from their own PC. ACKO envisage this to be a fairly "typical internet service", which will be

used by customers who want to place a single specific order or who only use a home shopping service from time to time.

- **In store** – ACKO-from-Home is an ideal mechanism for extending ACKO's in-store product range. So, although not part of the first phase, there is a desire to install in-store kiosks, from which customers can order items otherwise not available to them from ACKO.

Whatever the channel, ACKO are absolutely certain that they want all necessary security services in place. They haven't yet thought through all the issues – such as the need for a customer to "log on" and to have an "account", but they are well aware of the public's concern about the security of financial transactions (such as the transmission of credit card details) over the internet.

ACKO wants to focus on selling large kitchen electrical appliances online, including washing machines, refrigerators, freezers and cookers. They require this solution to be live and running within 3 months, ready for the New Year sales.

Aspects of the service that must be accommodated include:

- **Catalogue search** – It must be possible to browse through the catalogue online with a key word search or/and a product category search.
- **Complementary services** – Customers should be able to request machine installation at home by a local electrician and/or buy a service agreement for maintenance.
- **Printed copies of orders** – Customers need to be able to print their order or get a printed version by mail when ordering by telephone.
- **Special Offers** – When appropriate, special offers (such as "buy one get one free") available in the stores will be available via ACKO-from-Home. However, it must also be possible to tailor special offers to particular channels.
- **Order history** – One thing ACKO do want immediately is the opportunity for their customers to view their own "order history". ACKO want to be able to see trends in purchases to help target future marketing.

2.3 Who? (Involved Parties)

ACKO are working with a number of other suppliers on this project – and doing quite a bit of it themselves. In general terms:

ICC is responsible for the development and deployment of the home shopping order management application. This includes order generation across all channels, as well as those parts of the fulfilment systems that monitor the progress of orders. We will also be responsible for all customer information associated with the home shopping service.

ACKO have engaged several other agencies to provide fulfilment services (called fulfilment agencies). In these cases, the Order Management System (being built by ICC) will be responsible for providing the appropriate information to these 3rd parties (initially by web pages accessible only by fulfilment agencies). We will also need to be able to handle order status changes as they are fulfilled.

ACKO plan to use their own existing IT services wherever they are able, for things like payments, supply chain (stock replenishment) and product management.

This means that we'll have to provide the necessary sales information to the right systems and be able to accept product line and price changes into our "catalogue" from elsewhere in ACKO.

All we'll have to do is make sure we feed these systems with the right data, at the right time – and then monitor each order's status as it is processed through the warehouse and on to delivery to the customer.

2.4 Fulfilment Considerations

ACKO have already decided that the fulfilment aspects of the system will be based on a network of "home shopping" warehouses, not their existing stores. This is driven by their desire to reach areas where they have no stores because it'll be much easier and cheaper to set up a warehouse on a trading estate than to establish a new high street store. They also have a desire to avoid disruption and extra workload on their store personnel.

How these warehouses will be structured is not yet clear – they will:

- Either be built to resemble an ACKO store, in which ACKO employees adopt the role of shoppers, using the same IT systems as are currently employed in ACKO stores, and therefore using the same EPOS ("electronic point of sale") and "checkout process".
- Or be a "retail/miniature" variation of ACKO's existing warehouses (which ACKO call depots), receiving goods directly from suppliers and using the same stock management systems as the larger depots.

They are also in discussions with several organizations which will separately provide fulfilment services, such as installation, for all products that will be offered by ACKO-from-Home.

2.5 Payment Mechanism

It has been decided that customers will pay for their "ACKO-from-Home" goods via a Debit or Credit card – although there are plans to introduce a ACKO Account (with credit card?) in the future.

At the time of order, the customer will provide credit or debit card details which will be authorised via the bank connection at ACKO's Head Office. Settlement of the transaction will be processed in a standard way by ACKO's existing banking arrangements. Settlement takes place overnight following the successful delivery of the order to the customer.

Where an order is fulfilled by more than one agency (such as equipment and installation), then several credit/debit card transactions may be required.

2.6 Constraints (Budget, Timescales, Integration etc.)

As always, ACKO are running this project on a tight budget. They are also anxious to announce the successful launch of the service for customers in 3 months time to be able to get some of the New Year shopping over the new channel.

They know they need a robust, flexible system that will last for years – that's why they engaged us!

To a large degree, we expect the ACKO-from-Home system to be separately implemented from ACKO's existing IT – for example we've already agreed it will have its own customer information system (CIS).

Nevertheless, we will need to make sure it fits smoothly within their existing and future IT investments. For example:

- If ACKO decide they want to use our CIS in its store systems – or maybe they bring out a ACKO Credit card or even re-introduce a loyalty program – they will want to "migrate" our CIS to become a corporate system.
- Where existing ACKO systems already deliver services we need – such as payment, supply chain, and product management – then we must use them. Of course, we'll have to take care we understand the extra load ACKO-from-Home will place on them.
- The new OMS will need to communicate with the Call Centre and Fulfilment agencies using the planned ACKO web and collaboration tools.
- We've also heard from ACKO's Data Manager – he'll be anxious to see us use existing databases wherever we can. In some cases this will be vital, such as ensuring product lines are synchronised between ACKO's physical stores and ACKO-from-Home.

In order to meet the above timescale it may be necessary to launch the on-line systems before fully completing arrangements for the new warehouses and the call centre.

3. Other Notes and Memos

3.1 Memo from ACKO's Applications Manager

From: ACKO Applications Manager
To: Abel.Leader@icc.biz (ICC Responsible Partner)

Abel,

Thanks for the email – I think I know what you want to know!

Almost all of our corporate systems are built on IBM mainframe technologies – either:

- developed ourselves in CICS/Cobol (such as the Product Management system),
- implemented as DB2 based packages (the central supply chain system is one of these),
- supplied as a turnkey service (which is the case for the credit authorisation and settlement system via a payment gateway installed in our data centre by the bank).

The new system needs to support all major current browsers.

We decided that Java should not run on the clients (after we had some bad experience managing this before).

In order to ensure currency of catalogue information, the system should read the necessary data from the appropriate database.

The stores' sales system is based on SAP where all pricing information will be loaded from an ASCII file.

We're just about to start implementing Notes as our standard groupware to all our users, for email and other collaborative applications.

3.2 Memo from ACKO's Data Manager

From: ACKO Data Manager
To: Abel.Leader@icc.biz

Hi!

I understand you're involved in the ACKO-from-Home project. I'm not sure exactly what it is you need to know, so I've listed the major existing databases currently in operation in our central IT services, particularly those supporting the stores.

Database	System/Location	Brief Description
Product Catalogue (SAP System)	S390/Headoffice	All the stuff we sell, have sold or might sell. Includes SKU[1], description, price, price history, max/min stock levels.
Central supply chain	S390/Headoffice	Enterprise-wide product stock and supplier details, synchronised daily with each depot's local supply chain system.
Local supply chain	RS6000/Depot	Supplier details, lead times for supply of goods, delivery schedules for stock replenishment, current depot stock levels.
Marketing/Branding	RS6000/Headoffice	Contains details of current/past offers and brand info.
Data Warehouse	Unix/Head Office	Customer data collected from stores
HR	RS6000/Store	Time and attendance and other HR data
Credit Card Hot List	RS6000/Store	Details of credit cards that have been stolen/withdrawn. Updated over night in stores

You should bear in mind that, at the moment, all these data sources are only available for on-line transaction processing during normal scheduled service hours.

Under normal circumstances, each of the 100+ stores is polled from the data centre daily, after in-store end of day processing is complete. This uploads consolidated sales data, any stock management information and downloads product information such as price or product line changes.

Similarly, each of the depots Local Supply Chain systems is polled from the data centre daily, after in-store end of day processing is complete. This synchronises their product, stock and supplier data with the central Supply Chain system.

[1] The unique product code for the product. This is a universal number, often presented on the product as part of a bar code.

3.3 Memo from ACKO's Systems Manager

From: ACKO Systems Manager
To: Abel.Leader@icc.biz

Dear Mr Leader,

As per your request, please find below a brief summary of ACKO's current IT inventory across the organisation:

Platform	Operating System	Middleware	DataBase	Application Develop't	File Transfer	Systems Mgt
S/390	OS/390 R2.6 JES2	CICS 4.1.0 IMS 5.1	DB2 4.1 DL1	COBOL II	Endevor Netview DM MQSeries 1.2.1	Tivoli Netview PM RMF etc.
Unix Server	AIX 4.3.2	COS/Batch MQSeries 5 Lotus Domino 6.1	Oracle DB2 5	C & C++ uFocusCOBOL VisAge/JAVA	FTP (+utility) Netview DM	SM/6000 PerfMon SYSBack
Business Application Server	OS/400 V3.7	(native)	DB2/400	RPG/LE VisAge/RPG	QDSNX FTP	OS/400PrfMon Op'n Navigator
EPOS	OS/4690	4690 TCP/IP StoreLoop	--	4690 Basic	Netview DM FTP	--
PC	Windows XP	MQSeries 5	--	VisAge Basic	Netview DM FTP	Tivoli clients
WAN (Routers etc)	CISCO IOS	--	--	--	CISCO works	CISCO works

You may also be interested in understanding how these systems are distributed across the ACKO organisation:

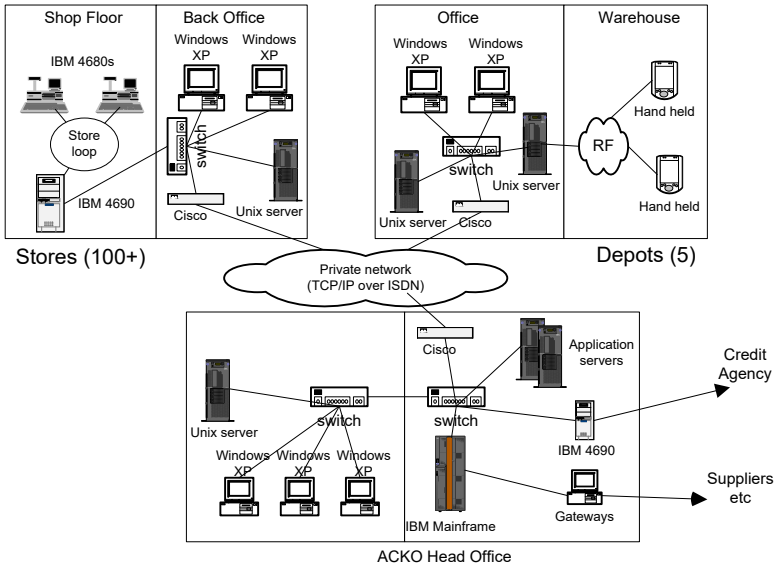

Figure 1: ACKO Systems topology

I understand from the applications architect that you have already received some information on the applications these systems support. However, to ensure you have a complete picture, I have briefly summarised the functions of each system below:

- The IBM mainframe. This delivers the bulk of our IT services (finance, payroll, product management, central supply chain etc.).
- Marketing use the Business Application server, and we also have a large Unix server as a data warehouse.
- The stores run IBM 4690 servers and 46802 tills, connected back to head office over our private network
- The in-stores systems (such as "time and attendance" and the in-store Human Resource systems) run locally in each store, on a Unix server.
- We've recently implemented an integrated goods handling system in the depots, based on radio frequency Hand Held Terminals for "goods-in", "picking" and "goods-out".
- The Unix servers support all our staff in all locations (head office, depots and stores) for all their general requirements such as file and print services, as well as hosting the Lotus Notes services.
- All staff users are provided with workstations running Windows XP. Users access the various mainframe applications either via IE6 or "green screen" emulators. Some have their own PC clients – I can provide more details if you require them. All word processing and other office applications are provided via Microsoft Office or Lotus Notes.

Please feel free to contact me if you require any further details.

Regards,

Systems Manager, ACKO.

3.4 Geographic Distribution

The following locations will probably play some part in the ACKO-from-Home service. We've managed to identify some of the characteristics of these locations (such as service hours), but by the time you're fully engaged we hope to have more details.

- **ACKO Head Office and Data Centre**
  This is situated in a large northern town, on a single site with modern IT and network facilities. The Data Centre is on site, serving all head office users directly.
- **"ACKO-from-Home" Call Centre**
  This will be managed and run by a specialised organization, from a single site elsewhere in the country. All staff will be supplied by the 3rd party, although all IT infrastructure and applications will be supplied by ACKO (or their technology partner).
- **"ACKO-from-Home" warehouses**

[2] Cash register

These will all be in new yet-to-be defined locations. These warehouses will operate 24 hours a day, 6 days a week, supporting a reduced service on Sunday and Bank Holidays. They will probably be stocked via the ACKO Depots, in the same way as ACKO's stores.

- **"ACKO-from-Home" central systems**
  It is not yet clear how these will be hosted, or how they will connect to the other bits of the system – particularly how it will link to the internet / WWW channels (maybe via a managed service?!).
- The home shopping service will be available 24 hours a day, almost every day of the year, while existing corporate systems operate on a standard 07:00-20:00 day during the week, with a limited service at weekends. So in order to ease operational requirements, it is possible the ACKO-from-Home central systems will be located elsewhere. It'll probably be on site, although discussions are underway with vendors to provide a hosted service.
- **ACKO Stores**
  During "opening hours" (typically 09:00 to 18:00) all store based systems operate "stand alone", using local systems for stock management, personnel and other "back office" systems. The exception to this is credit authorization, which requires an on-line link to Head Office for connection to the credit checking agency – this service is available 24/7.
- The Data Manager has outlined how data at different locations is synchronised.

The following picture tries to show how the various ACKO locations may inter-connect (the solid lines), as well as showing the different ways an ACKO-from-Home customer might use the service (the solid arrows). "ACKO-from-Home in store" is included (with a dotted line), but we think this is something for the future:

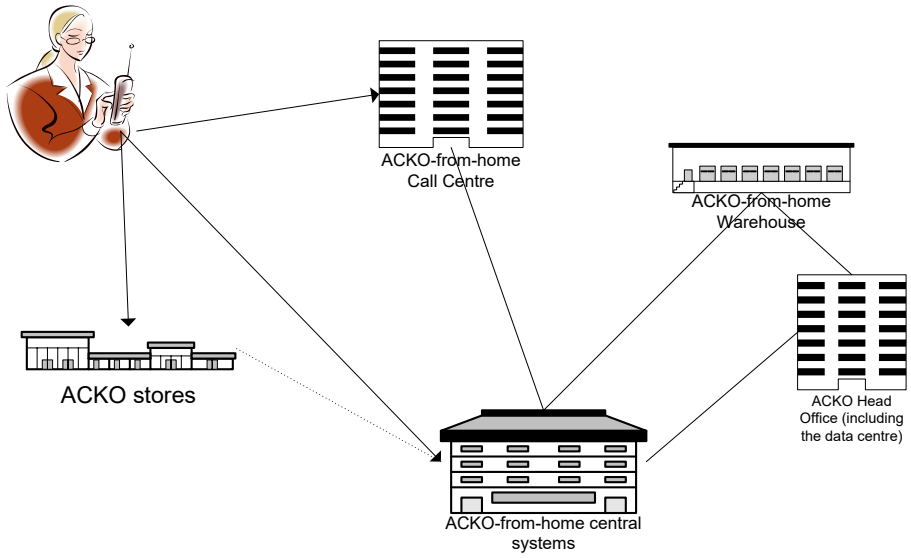

Figure 2: "ACKO-from-Home" locations, showing the three "channels" for an "ACKO-from-Home" shopper

3.5 Operations and Systems Management

Notes from: a conversation with the Operations Manager

The Operations Manager was particularly anxious for us to work within what he saw as sensible limits of availability and performance for what he called “client / server” systems. ACKO’s head office users are accustomed to high levels of service from their mainframe hardware and sub-systems, where they can expect availability of the order of 99% or more from each component - mainframe, database etc... For non-mainframe components, ACKO have achieved levels of availability, around 95% to 99% depending on the experience level of staff and the quality of operating and application software.

He is very worried that the complex multi-component system we are about to design will not be able to achieve “mainframe standards”, which will lead to disappointment with the overall level of business reliability – particularly for channels which interface directly with customers and are needed 24 hours a day. He offered to do everything he can to help us ensure we take this into account when setting realistic expectations with our users, including advice on how we might implement fall-back mechanisms and procedures which would kick in, in the event of a partial or complete system failure.

He told as a bit about the Usage Profile that they expect: Based on experience gained by a business partner in Canada, which has been operating in this way for the past 3 years, ACKO estimate that they will have approximately:

- 30,000 customers per year
- 200 people accessing the catalogue simultaneously
- 60-70 orders per day
- 7,000 visitors per day

-End of Case Study-