ANNEXURE I

QUESTIONNAIRE USED IN THE CASE STUDIES
QUESTIONNAIRE I ( FOR SENIOR MANAGEMENT )

1) What were the circumstances based on which this project was selected?

2) Considering the fact that your department has had mostly manual systems since inception how and why did you select this particular activity for computerisation?

3) How did your department conceive of computerisation on such a large scale at that time?

4) How was the modus operandi for computerisation of this work activity which is spread all over the country, decided upon? Was any reference model selected for this project? On what considerations was this decision taken?

5) How did you plan and manage to involve the various agencies related to this activity such as unions, users and other related government departments etc. involved in this process?

6) What strategies were devised and used to handle the profound impact this project would have on the work ethos of your department?

7) What in your opinion were the features unique to this project?

8) Please enumerate some aspects which you feel caused a major influence on the approach, development and implementation of this project?
9) What type of motivation was offered to various tiers of management involved in this work? Has it achieved the desired results? Could any other approach have been more effective and why?

10) If you were to undertake similar project again what would be the aspects / areas specifically falling in the area of 'management of change' that you would like to change

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QUESTIONNAIRE II (FOR MIDDLE LEVEL MANAGEMENT)

1) Please indicate the post in which you were associated with this project and briefly indicate the work responsibilities you handled in this post.

2) How did your department conceive of computerization on such a large scale at that time?

3) How was the modus operandi for computerization of this work activity which is spread all over the country, decided upon?

4) Was any reference model selected for this project? On what considerations was this decision taken?

5) Was a core team formed for defining the scope etc. of this project?

6) Were the senior decision makers at ministerial and board level involved at any stage?

7) What sort of support or otherwise did you receive from them?

8) In what way their involvement or lack of it affected the effective implementation of this project?

9) Was any cost benefit analysis done at any stage? What data was collected for conduction of a cost benefit analysis of this project?
10) Was any reference model selected for this project? On what considerations was this decision taken?

11) Was the development of software handled by your department or was any other agency involved?

12) What in your opinion have been the advantages / drawbacks of this approach?

13) What type of motivation was offered to various tiers of management involved in this work? Has it achieved the desired results?

14) What were the major difficulties experienced at your level during the various stages given below especially from the 'management of change' of the work culture of the organization?

   a) Planning and sanctioning of the project.
   b) Development of software.
   c) Planning for implementation and actual implementation.
   d) Final change over and running of this project.

   How were these overcome?

15) In your opinion has this project achieved the objectives conceived and set out at the beginning? Please give brief reasons for your observations.

16) If you were to be associated with similar project again what would be the aspects / areas especially falling in the area of 'management of change' you would like to change or approach differently and why?
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QUESTIONNAIRE III (FOR FIELD MANAGERS)

1) Please indicate in what capacity (post) were you associated with this project? Please give the period.

2) Please tick mark the relevant activities given below in which you shared the responsibility or made vital contributions while working on this project.
   a) Study of manual system to define data specs.
   b) Selection of appropriate supervisory and field staff for initial development and testing.
   c) Setting various objectives for the software so as to make it capable of handling day to day problems.
   d) Testing of the software and obtaining approvals for departures from existing procedures from concerned authorities.
   e) Establishing dialog with fellow managers, supervisory staff, unions and users.

3) Were you managing these activities alone or was there a team?

4) What was the composition of the team? Was the approach adopted in managing the change in this manner correct?

5) Was some other approach possible for increasing effectiveness of this project?
6) How did you motivate the staff under your charge to take genuine interest in this activity?

7) Did you face any resistance in this work from your staff or colleagues? How did you overcome the same?

8) What type of feedback system did you set up for effective monitoring of the work entrusted to you?

9) How did you manage the problems related to your staff which were beyond your powers of sanction?

10) How did you manage to incorporate changes suitable to computerization but demanding changes in existing codes and procedures?

11) What problems/difficulties were faced by you during planning and implementation of this project from:

i) Supervisors / Junior Officers

ii) Field staff

iii) Customers

12) Did you face any resistance from staff or users which was more of a hypothetical nature rather than practical? How did you tackle the same?

13) Do you feel you got adequate support and guidance from your seniors for effective execution of your responsibilities? How did you manage the situations where such support was late in coming or was not available?
14) How did you plan the training of your staff? Was it adequate? What steps did you take to motivate the staff for training and later working on the system?

15) What in your opinion would be the factors which have affected the process of management of change in this project?

16) Has this project achieved the objectives it was supposed to achieve? Please give brief reasons in support of your response.
QUESTIONNAIRE IV (FOR FIELD STAFF & SUPERVISORS)

1) Please indicate the post in which you were working before joining the computerisation project?

2) What post were you given in this project?

3) Why do you think you were selected for this project?

4) Did you possess adequate knowledge for this work?

5) What training was given to you? Was it adequate to generate confidence in you to take up your new responsibilities?

6) What criteria did you follow while selecting other staff to help you with implementation of this project? Could any other criteria be adopted for more effective implementation?

7) Were any incentives provided by your department to staff undertaking this work?

8) Would the results of this computerisation been different if such incentives were not given?

9) Could incentives in any other form improve the implementation process?

10) What type of problems did you face in motivating your colleagues and juniors in spite of these incentives? How did you tackle them?

11) Did you experience any resistance from users of this system? How did you overcome them?

12) Was the new computer system run in parallel with the manual system? For how long?
13) When was the manual system discontinued? If not why was it delayed?

14) What has been the impact of this step on success of this project?

15) Were there any changes in the existing procedures in the new system? How did you manage to convince your colleagues and customers to accept these?

16) Has this computerisation in any way affected the prevailing 'line of command or power balance' in your department?

17) Has any of your colleagues or juniors felt this new system as a threat to their powers or authority?

18) How was this attitude of theirs tackled?

19) Has this computerisation in your opinion benefited the users and your department? Please give reasons for your answer.

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ANNEXURE II

FEEDBACKS RECEIVED FROM RAILWAYS
Q.NO. 1) What were the circumstances based on which this project was selected?

ANS: For analyzing the circumstances which led to this project we will have to go back to the time when computers were set up on Railways. The first computers, the IBM 1401 were set up by IBM in early sixties. Since then IBM continued to suggest new areas where computerization could be introduced. However after IBM left India, between 1970 to 1977 there was precious little done on I.R. to increase the scope of computerisation. No new projects were taken up for computerisation. But the issues were being discussed time and again as a result of which a task force was set up in 1977 under the charge of Adviser Finance to consider all those areas where computers could be usefully utilized. It was a very exhaustive report. Passenger reservation had been mentioned in this report amongst others. Freight operation was also mentioned in this report. The R.B. in their wisdom chose freight computerisation first and it was decided to send a high level team to various railway systems to study how they had computerized their freight operation. This team led by Mr.Gill then Adviser Finance went to France, Germany, U.K., U.S.A. and Canada. This team while recommending a plan for freight computerisation also suggested taking up the activity of passenger reservation on the stand by computer required for the freight management system. At this time on
world banks' suggestion a separate Directorate of Operation Information System (O.I.S.) was set up in 1981 and I was appointed as it's first Director. My work consisted of coordinating and planning all operations related computerisation projects on I.R. When I studied the expert committees' report I felt that it was not appropriate to link passenger reservation project with freight computerisation, for two reasons. Firstly the freight computerisation was a massive project by any standards and may take a long time in completion,, which therefore may delay the passenger reservation project also. Secondly I felt that passenger reservation computerisation could be developed with far greater ease than freight operation. I also felt that this would be a system totally transparent to the user and thus may give a good dividend to the railways not in terms of additional revenue but in terms of goodwill it could generate from the passenger who were subjected to lot of difficulties in the then prevailing manual system. I therefore was against linking this project to freight computerisation which was a long gestation project. Thirdly I felt that for a large and complex organisation like railways going from the level of 1401s to an 'On line real time' system would have been too much of a quantum jump in technology as well as work culture. The passenger reservation which was a much smaller but 'On line real time' project could have established our organisations' preparedness to handle such project and also whether our organisation was capable of sustaining such a technical activity like a real time system. It would have given us a good index for judging whether we should sink a huge sum in a freight computerisation system. As far as financial viability was concerned the same could not be quantified unless railways were prepared to levy
additional surcharge on all such tickets issued by a computer, but the R.B. members did not feel it proper to levy such a charge and found a via media of charging this project to passenger amenities work which did not depend on financial returns, the minister also accepted this position.

Q.No.2) Considering the fact that your department has had mostly manual systems since inception how and why did you select this particular activity for computerisation?

ANS: It is true that there was a lot of skepticism among field officers up to the highest levels about such a system succeeding on the railways. The Railway Board had already decided to go in for freight computerisation, which was a very complex system. PRS was also visualized as a byproduct of FOIS. We however felt that PRS should come first and FOIS only later. The idea was to test the capability of the experts in India and in the railways for developing a relatively simpler yet complex software. Even for the PRS software we decided to first go in for a stand alone system and study its results. If the expertise in India was not to be available to develop such a relatively simpler system then perhaps we will have to be totally dependent on foreign input for the entire freight computerisation. We also had to take a decision as to how much software we should import for FOIS and how much to develop indigenously. Even if import of a large software package was permitted at all it would have certainly required some internal modifications to suit our system and we had to decide whether we have the capability of doing this modification work or even for this we have to depend on foreign expertise. At that time there was a debate in the country between those favouring indigenous efforts and those favouring import of a tailor made & successfully established
package, since FOIS is a much too complex system. Because it is such a vital system it was not worth taking a risk of giving it to our own experts who till then had no experience of developing a real time on line system. Therefore I felt all these decisions were linked to our judgment of the available indigenous expertise and listening to this debate which was going on in the country I was reasonably sure that expertise in India could be given a fair trial in the development of this system. So I felt that instead of linking PRS to FOIS let us try indigenous expertise in the development of passenger reservation system in India. Thus we decided to take up PRS as a separate project be developed indigenously. Once this was decided we wanted to take up this project in time for the 1982 ASIAD games being held at Delhi. This was because a lot of new projects were being taken up for this purpose. The government was keen to put up a good show and use this opportunity to demonstrate our countries' capabilities in various fields. Besides it also meant faster sanction and a time pressure on us to complete the project. Further it also afforded us an opportunity to display our capability in developing a complex software system not only in India but worldwide. So I pleaded our case with the board very strongly that while we would finally develop and implement this system for the entire city of Delhi yet by the time of ASIAD we could introduce the new system for some trains to display our ability. The board held a special meeting for taking a decision on this aspect. The then Financial Commissioner Mr. Poulose pleaded that in view of his experience of the then EDP activity on the Railways and the expertise available in the country, we should not link this project with ASIAD. Because although by itself the project had excellent potential yet by some
chance if we fail to make a success of this project in time, the negative publicity we may get will be much more damaging. So it was decided that while all clearances will be given to it but the project should not be linked with AMIAD.

Q.No.3 How did your department conceive of computerisation on such a large scale at that time?

ANS:— At that time there was also a demand coming from a number of railways to take up computerisation of some isolated trains or windows etc. on P.C costing 3 to 5 lakhs and so on, while we were asking for Rs. 8 crores from day one. Here again we felt that taking up this activity on such a small scale will mean only computerisation of our manual registers but the public will still have to come to one single window and the benefits which such a system should give to the passengers will not be forthcoming. We could see one major benefit of across the counters computerisation i.e. "universality". The passenger in this system could approach any window to get ticket for any train of any class. This would not have been possible by introducing computers on single windows etc. So we thought that at R.B. level we must think on a bigger canvass and take up this project on the basis of one city at a time. In Delhi the reservations were being done at a number of places separately for different classes. Northern Railway however showed no interest or initiative in any way in this project which was conceived, planned and executed at the Board level. Luckily for us at that time there was a change in government and we were lucky to get a Railway minister of exceptional caliber and administrative capabilities, Mr. Madhvrao Scindia. From the very first day he got interested in this project. But by then the F.C. had changed and the
neve F.C. Mr. Venkataraman was more inclined to take up the cheaper alternatives suggested by various railways on a smaller scale. The minister asked for a presentation where we brought all the aforesaid aspects to his notice; stressing on the fact that most of these systems will mean a mix up of manual systems with partial computerised systems, which in our opinion could not coexist. The minister accepted our point of view and gave a clear go-ahead for our plan. In spite of this two railways W.R. and S.E were given sanctions for developing floppy based isolated systems. And as we had correctly surmised both these projects were total failures. We selected Delhi because it was right next to us and we could have monitored it better. Similar discussions had also taken place in case of freight computerization where again similar decision was taken for N. R. in spite of least interest shown by them.

Q.No.4) How was the modus operandi for computerisation of this work activity which is spread all over the country, decided upon? Was any reference model selected for this project? On what considerations was this decision taken?

ANS: While deciding this, at the back of our mind the objective was to test the capabilities of railway personnel and local experts in developing and implementing such software. We did not select any reference model as none of the advanced railway systems had a decentralized system while we had such a system in mind. Most of them had one central computer with terminals located at all requisite stations and offices in their railways. Even the Airline System in India, was totally centralised. So we had no model to follow. A great debate was going on at that time on this aspect.
i.e. whether we should have a centralised or a fully distributed approach for FOIS. Finally we chose a combination of both or what we called functional distribution network for FOIS. But in case of passenger reservation we selected a distributed approach. The reason being that this application was more suitable for it and the state of communication technology available in the country could not support it. Besides since we had opted for a system which could be built up block by block, the distributed approach was considered the best.

During the planning for freight and passenger computerization we had interacted with most of the major computer companies in India like ECIL, CMC, ORG Tata Bouroughs etc. In fact it was Tata Bouroughs who approached us first with a proposal for adopting a package developed by them for PRS on the Burrough's machine. At that time there was only one indigenous manufacturer of mainframes in India viz., ECIL. However the size of their computer was such that even the most powerful computer manufactured by them did not have the desired capabilities to support PRS activity in just one town i.e. Delhi so we studied all the imported systems being offered by vendors including Tata Bouroughs and found the VAX system offered by DEC as most suitable as it had a cluster capability which permitted a bit by bit building up capability. We felt that in view of the problems being then posed by U.S. govt. for supplying powerful computers to India it was better to start with a smaller machine and keep on expanding as the need arose. CMC was the OEM supplier for VAX in the country and thus we could get these machines at a comparatively cheaper price and with much ease. Further the then DOE secretary Dr. P.P. Gupta, also indicated to me that in case Railways placed the order for
this machine with CMC his department will waive the condition of floating global tenders, which was a laid down practice then. Global tendering was a highly time consuming process involving a time frame of 2 to 3 years. Further I was also told by Dr. Gupta that although we were free to select our own software vendor, his dept. will give us full support if we placed our order with CMC, and will also ensure that CMC will deliver the goods even if they have to import some foreign experts for this work. CMC was also a public sector company so dealing with them was much easier. At this time we had also taken up a separate project jointly with CMC called Project Interact. Because of this project we had been able to assess the technical competence of CMC in the area of software development and we were quite happy about it. Thus the contract was given to CMC both for the VAX machine and the software development on a single tender basis.

Q.No.5) How did you plan and manage to involve the various agencies related to this activity such as unions, users, other related govt. departments, involved in this process?

ANS - The selection of core team for this purpose was very crucial. I had been on the look out for a proper team leader. My aim was to select someone who had a work study experience, as felt, work study gives one the capability of splitting every work activity into small systematic steps which I felt would be extremely useful quality during software development. Secondly I wanted a person who had excellent interpersonal relationships i.e. was capable of carrying a group with divergent opinions. We wanted someone who was not authoritarian on approach to management but a democratic one. A person who could overcome controversies in amicable manner. We short listed three such persons, got
their willingness to take up such task and put up these names to board. That is how Mr. R.D. Saklani who also happened to be on N.R. and at Delhi was appointed as team leader of the core team. He in fact took up this task even against the wishes of his G.M. Then both of us formed a team to select other junior members from N.R. for his team. The uniqueness of this project that it was a project proposed developed and sanctioned not by N.R. but by our directorate in the Board for with absolutely no help from them.

Q.No.6) What strategies were devised and used to handle the profound impact this project would have on the work ethos of your department?

ANS :- We worked as a team right through the pilot project. Our core team also consisted of people from CMC and we thrashed out each and every aspect of reservation system in great depth all the time giving great stress on the utility of the new system to the passengers. We did not compromise on the functional utility of the system in any way even sometimes at the cost of technical overheads. The concept of wait list management was one such case. Our system has number of unique features which even airlines do not have. CMC was quite reluctant to try such new logic but we insisted upon it. In fact the dual wait listing on the ticket and the feature of automatic allotment of seat or birth to the wait listed passengers by the computer strictly on FIFO system was greatly appreciated by everyone later on. The concept of a combined journey cum reservation ticket was another feature which met with some resistance but we discussed the matter at great length and logically with CMC and finally got it incorporated. In fact I, Mr. Sakalani, and my additional director finance, Mr. K. Vishwanathan got along extremely well. We also had full
support of our board members most of the time. In fact I had a direct access to our Minister all the time. Our procurement of the computer from U.S. was delayed because of some hard attitude taken up by U.S. govt. then. On learning this Mr. Scindia personally spoke to the U.S. ambassador to India and got the computer cleared. This he did in spite of the fact that the then chairman R.B. Shri K.T.V. Raghavan advising the Minister that he should not involve himself with this project which from the very beginning was deemed to fit and bring bad name to him. Finally it was the personal interest which the Minister Shri Madhavrao Scindia took in this project which was a very effective motivator to one and all.

Q.No.7) What in your opinion were the features unique to this project?
ANS.:- The thorough research that went into developing the software so that it eased pass a confidence and offered them all the conveniences which a passenger looks for, while effectively eliminating the drudgery and drawbacks of the old manual system was a unique feature. Secondly it was a total indigenous effort. It also helped us in realising our own capabilities in developing or modifying a real time interactive software.

Q. No.8) Please enumerate some aspects which you feel caused a major influence on the approach, development and implementation of this project?
ANS:– Following aspects caused a major influence on this project:
1) Our ability to win over the unions. We assured them that this project will not lead to retrenchment or reduction in promotional prospects of staff. On the contrary it will certainly make the working conditions much more comfortable. In fact this has been one of the important aspects which resulted in success of this project. Earlier our counter clerk was a harassed
person, always doubted by everyone as a manipulator. They had to spend long hours after duty in closing the accounts. All this was done away, the needle of suspicion moved away from them. This is what motivated the staff in switching over to computers on their own in spite of our not giving them any special pay for this work. During field trials a stage came when the female operators would virtually break down if they were moved from the computer terminal to a manual counter. This sort of reactions totally eliminated resistance from unions so much so that on E. R. the unions started pressing for computerisation.

2) Work As A Team: This was the first system of its kind totally planned, developed and implemented in India without any outside help. It was at the pilot stage itself all the features required for future expansion and linking were discussed and included. We had planned for all eventualities and requirements of future. Provision in the software for giving telex links to roadside stations was one such example.

Our software development team consisted of myself and Mr. Vishwanathan from R.B., Mr. Sakalani from N. R., Mr. Ramesh Jhunjhunwala and Arvind Sharma from CMC. We never considered them different from us, and had respect for each other. We all treated this project as a national project. So we as a team were discussing even matters related to CMC's internal management of their personnel assigned to this project etc. CMC did face some problems in development of software leading to their developing cold feet midway. But to our good luck Dr. P.P. Gupta who had helped us as secretary DOE had by now become the chairman of CMC and his no nonsense approach and clear resolve to honour this commitment at any cost paved the way for completion.
3) When this work started there was a school of thought demanding our increased role in software development. But since we had undertaken a project first of its kind and against a lot of skepticism on part of fellow officers, we did not in any way create any hurdle in the work of CMC. Any effort on our part in sharing the development of various modules etc. would have positively slowed down the project. Once the project was through I as E.D. CRIS offered to develop the second version of this software totally with our own efforts. In fact the modification of PRS software for Secunderabad is on a different hardware platform, was due faulty with CRIB team.

4) The interest, guidance and support that was given by the then minister for railways Mr. Madhavrao Scindia. This made other persons in Board and N. R. who could have otherwise caused problems keep low. Some did try but without success, as was tried right from the day one by CCS N. R. but we could tackle him because of the full support from the Minister.

5) The rapport I developed with Dr. P. P. Gupta and his additional Secretary Mr. Ashok Parthasarathy was most useful in speedier completion of this project as at that time DOE was considered to be the biggest stumbling block for any such projects.

Q. No 9) What type of motivation was offered to various tiers of management involved in this work? Has it achieved the desired results? Could any other approach have been more effective and Why?

ANS :- No motivation of any sort was given by us at managerial level. At field level some people were given out of turn promotions, some good workers were given cash awards etc. But by and large the challenge of doing something unique for the country was a big motivator to the
managers and the obvious benefits the system offered in terms of day to day chores motivated the staff.

Q. No.10) If you were to undertake similar project again what would be the aspects / areas specifically falling in the area of 'management of change' that you would like to change or approach differently and why?

ANS :- In the area of management of change really speaking I do not feel any change would be necessary. But in the area of planning for various facilities etc. one could have contained some of the redundancies we provided for faster and safe completion of this project of this scale.

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TRANSCRIPT OF INTERVIEW HELD WITH Mr. R.D.SAKALANI (Chief Projects Manager, Passenger Reservation System; Northern Railway, New Delhi)

Q. NO.1) Please indicate in what capacity you were associated with this project?

ANS :- I was associated with this project as the chief project manager N. R. at Delhi where the pilot project of passenger reservation system was taken up prior to its' expansion to other centers on Indian Railways. Later on I also became executive director of O.I.S., the nodal directorate for implementation and expansion of this computerisation project all over Indian Railways.

Q. NO.2) Please tick mark the relevant choices given below in which you shared the responsibility or made vital contributions while working on this project.

a) Study of manual system to define data specs.

b) Selection of appropriate supervisory and field staff for initial development and testing.

c) Setting various objectives for the software so as to make it capable of handling day to day problems.

d) Testing of the software and obtaining approvals for departures from existing procedures from concerned authorities.

e) Establishing dialog with fellow managers, supervisory staff, unions and users.

ANS :- I as the head of the implementation team handled all the responsibilities cited above.

Q.No.3) Were you managing these activities alone or was there a team?

ANS :- The reservation system on Indian Railways is a complex one in that we have number of classes of travel, different types of trains, a variety of coaches of same class having different seating or sleeping arrangements a
variety of concessions etc. In manual system all these complexities were being handled by the counter clerks. In order to enable the computer to handle this work it was essential that the manual system had to be systematically analysed. It was too much to expect an outside agency like CMC to fully appreciate the same. It was therefore decided to form a core project team which consisted of 7 / 8 system engineers from CMC and 4 / 5 group A railway officers. I was selected as leader of this team for N. R. In this team we further included at least one representative from each category of staff working in the manual systems in Delhi. Thus our team consisted of about 20 / 25 people.

Q. No. 4) Was the approach adopted in managing these activities correct? Was some other approach possible for increasing effectiveness of this project?

ANS :- This approach was correct. We used to take each aspect of passenger reservation procedure and discuss it threadbare and at great depth. We were working everyday for 12 / 14 Hours. For this purpose for almost a year. The association of field staff in the development work at this stage helped us tremendously. We used to have debate for hours together on each aspect of working of the manual system and arrived at some agreed format, however if this aspect came up at later stage in connection with some other feature and if we felt that our original conclusions had to be changed we did such revisions number of times untiringly so that when we had completed the work it was more or less perfectly accomplished. I will attribute the success of our team to two factors firstly; we did not limit the core team to a few officers only but had representatives of all categories of staff who were actually working on the manual system. Secondly our approach of repeated discussions of each and every aspect in great depth and the time spent on it by the entire team, where everyone could give his or her opinion. This is evident from the exhaustive functional specs document created by us which runs into more than 250
pages and the user specs so well defined and integrated that for even a change as small as shifting a comma will mean change in the software. Our team had visualized all types of complexities that could arise in this system. Here we also felt that for every change or deviation if we were to approach the higher authorities such as chief commercial manager of our railway for approval and sanction, it would be an extremely time consuming process and slow us down. So we took a conscious decision that for changes in procedures which we found were logical and justified in the interest of the railways we will not approach anyone and go ahead and incorporate the same. Automatic allotment of seats or berths to wait listed passengers was one such feature which in manual system suffered from interference from various sources and had we referred it to higher authorities for decision, we were positive of not getting any clear directive as the matter might have been sent right up to the Minister. In fact we had learnt about the tremendous problems which the Indian Airlines faced in their wait list management and so we went ahead with a logic of automatic allotment by computer without any outside interference which was in the interest of passengers.

We also took great care in selecting the staff representatives in our team. Our criteria for selection was that the person had to be very positive in his or her approach to work, was intelligent, was prepared to handle such a change process and was liked by his or her colleagues and juniors i.e. a natural leader. I feel it was this selection process which helped us in making a success of this project. We did not resort to any formal selection but as we were already knowing the staff and were interacting with them for considerable time we could identify them easily. This especially helped in effective implementation of the project and its' acceptance by other staff.
In my opinion 90% of the effort in such project should go in preparing the functional specs. If these are capable of replicating the existing manual systems effectively then the efforts in software development, implementation and its' acceptance by staff become much less. This is what made our PRS software so efficient in that even after almost 10 years and spread of this work on about 2000 terminals all over India, there have been very few changes.

Q.No. 5) How did you motivate the staff under your charge to take genuine interest in this activity?

ANS:- Nobody likes a change as it poses a threat to individuals as many foresee their expertise in the manual system getting threatened. Many are afraid that in such new system they may not find a proper place in the new structure, their promotion prospects may get affected. Having anticipated such problems we preempted them by first holding a meeting with both the recognised unions on Indian Railways. We assured them that this computerisation will not result in anyone's transfer from present place of working; secondly their chances of promotion will not be reduced, thirdly there will be no reduction in staff. At the working level we adopted a different approach. The manual system suffered from some serious flaws for the staff. Firstly any action of theirs was suspect to vigilance check. In fact practically everyone at the counters had one or more charge sheet issued to him from vigilance. Secondly the accounting procedures were extremely cumbersome and time consuming leading to heavy admitted
debits against most of them. Some of them had debits to the tune of Rs. 10,000 or more. The staff had to spend long hours sometimes extending to 3 to 4 hours after end of shift to close the accounts which was not considered for overtime etc. This aspect of long duty hours was especially traumatic to women workers. This new computerized system solved all these problems at one stroke. This was projected in proper perspective to the staff with the result it raised the level of acceptance of the system by the staff tremendously. In fact as the work on the computer system could be done faster we reduced their counter time from 8 Hrs to 6Hrs. In order to improve the working efficiency of staff in using computers we also introduced performance based cash awards. At end of day the system would give counter wise performance which was compared with the average we had observed for a normal worker. A normal worker could handle 150 requisitions in 6 hours shift, so we awarded those who did more than 200 on sustained basis and displayed names of both good and poor performers. We also gave awards to a poor performer if he or she showed sufficient improvement in subsequent periods. A sustained poor performer was taken off the counter duty and put in a different job. There was no punishment to anyone. To begin with staff had little faith in this system. They were not able to believe that a computer could handle all the complexities of day to day working. That is where our selection of the implementation team helped tremendously. Once these select few whom the other staff accepted and liked were convinced about the efficiency, accuracy and utility of this system the job of converting the non believers became easier. The fear of handling the computers lessened when they found their erstwhile colleagues working very comfortably with the new
Q.No. 6) Did you face any resistance in this work from your staff? How did you overcome the same?

ANS: Since we adopted the approach mentioned earlier that is intensive participation by staff at all stages of development and implementation of the system there was practically no resistance from staff. In fact after first few counters were computerised there was resistance from staff to go back and work on the manual system even for a short while.

Q. No. 7) What type of feedback system did you set up for effective monitoring of the work entrusted to you?

ANS: Our whole project team although very large, worked very cohesively, nobody had any ego problems. All of us supervised the transition phase, constantly taking feedback from staff, solving their difficulties on the spot. We were talking to the counter clerks, patting good workers, giving immediate guidance and so on i.e. we developed an excellent rapport with the staff. This interaction was so intensive that there were no problems in getting accurate and timely feedback. We contacted the users on random basis everyday. Infact we received no complaints from users as they had really benefited from the system; the average waiting time came down from 2 / 3 hours to 30 / 35 minutes at peak time, now a passenger could get ticket or refund for any train or any class at any counter in Delhi. In case of refund the system calculated the amount generating more confidence in passengers. Counters were later on also opened all over Delhi resulting in large reduction in travel time of
passengers to the station and back for buying a ticket. A study was conducted by Indian Council of Industrial Research to assess the economic utility of this project. This study has projected a conservative estimate of Rs. 10 Crores per annum as the resultant saving in various resources of passengers in Delhi alone. Of course for railways the cost per ticket has been varying from Rs.8 / 9 per ticket at Delhi to about Rs. 30 per ticket at Bhopal in 1986. The facilities at most of the reservation offices all over the country were woefully inadequate, this project gave railways an opportunity to modernise them. This cost also got included in the cost of computerisation, which otherwise would have been much lower.

Q. No. 8) How did you manage the problems related to your staff which were beyond your powers of sanction?
ANS :- We did not face many such problems. Where such situation came up the matter was fully discussed with staff and later the matter taken up with higher authorities, as was done in case of demand for special pay. This demand was finally turned down at board level. But as staff was aware of the sincere efforts put in by us in this regard, they accepted it. Aspects such as reducing counter duty hours to six hours were implemented by the project team without referring to higher authorities, creating fate accompli situation.

Q. No. 9) How did you manage to incorporate changes suitable to computerisation but demanding changes in existing codes and procedures?
ANS :- When we had some differences, we used to discuss it as a team
thread bare for hours and try to reach an accepted solution but if an acceptable solution still evaded us that item was kept in abeyance for a few days and taken up again and again. Most of the time we found that an agreement would emerge. Only in few cases I had to finally give my final opinion. When we started there were more than 50 such objections which finally had come down to 4 or so. We also started buying our own ticketing stationary etc. ourselves and since nobody objected, we continued with it. Where ever such change involved changes in accounts code or had financial implications we obtained sanctions from appropriate authority by clearly defining our point of view. We got utmost help and cooperation from finance department at zonal and R.B. level in accepting such changes. The OIS directorate in Board steered these proposals in Board and got us the necessary approvals.

Q. No 10) What problems /difficulties were faced by you during planning and implementation of this project from :

i) Supervisors / Junior Officers

ii) Field staff

iii) Customers

ANS :- Remarks regarding these have already been given elsewhere in answers to other questions.

Q.No.11) Did you face any resistance from staff or users which was more of a hypothetical nature rather than practical? How did you tackle the same?
ANS :- I do not recollect any such instance as far as the users are concerned. As regards the staff our democratic approach of carrying people with us prevented such situations.

Q. No.12) Do you feel you got adequate support and guidance from your seniors for effective execution of your responsibilities? How did you manage the situations where such support was late in coming or was not available?

ANS :- While we had full support from the railway board my own boss the then Chief Commercial Superintendant, N.R. created some difficulties. In fact soon after introduction of this new system he gave a negative report and made my general manager sign it. In fact throughout the development phase he felt neglected and raised some hypothetical objections. This had created a negative impression at the senior level so that everybody had grave reservations about success of this project. Thus there was no support available from them. A confrontation took place in the full meeting of the Board with the Minister. The project thereafter went ahead only when the Minister visited the reservation office incognito and satisfied himself about the impressive improvement in service that had been achieved. It was an ego problem for my boss in that he felt that he was perhaps more qualified to do my work. Since we got support from the minister we did not pay much attention to it.

I got all support from my general manager, as regards the setting up of the infrastructure was concerned but as regards the efficacy of the software was concerned he had serious doubts. In fact one month before we were to go on line he called me to his chamber and asked me to do another small
project for the operating department as an alternative to be shown to the minister. My pleading with him did not help. So just prior to our going on line I was busy on both the projects.

Q. No. 13) How did you plan the training of your staff? Was it adequate? What steps did you take to motivate the staff for training and later working on the system?
ANS: We initially trained a few selected staff in the core group through CMC. As the development progressed this core group developed adequate expertise and confidence in not only working on the computerised system but also imparting training to others. Thereafter we ensured that these personnel only imparted training to their colleagues and not an outside agency like CMC. Each staff was trained for 6 days in the computer center. For first 3 days theoretical inputs were given followed by 3 days of hands on training and then they were put directly on the counters to face the public. This not only pushed them into the new culture but also developed confidence in them.

Q. No. 14) What in your opinion would be the factors which have affected the process of management of change in this project?
ANS: a) I took great care in selecting the members of my core team, that really helped during implementation as we worked as a cohesive group thereby instilling confidence in the staff.
b) In view of the possibility of not receiving much cooperation from immediate superiors our team took number of decisions on their own.
c) Adequate training was given to staff by our own staff. This helped in
demystifying the computers for them in that they felt that if their colleagues could not only learn the new system but also teach it they themselves could also learn it.

d) Members of the core team as well as those of O.I.S. directorate remained unchanged during the entire term of 5 years. No doubt I fought with my seniors to prevent some changes suggested by them, but I must say that we were very lucky in this respect. This aspect is very important for success of any project. Any change in the team can slow down the progress and if such change happens in case of the team leader the result can be sometimes very damaging. Continuity in such project is most vital. I was also lucky to get posted as E.D.,O.I.S. immediately after this project on N. R. was completed at Delhi and I was there throughout the period in which this system was expanded and implemented all over India. Infact as many as 35 cities had been covered by 1993 i.e. we had computerised 90% of Indian railways reservation work load. The work of covering the remaining 10% is going on.

e) Involvement of workers with the proposed system intimately in the development and implementation process was another major contributor to the success of this project.

Q.No15) Has this project achieved the objectives it was supposed to achieve? Please give brief reasons in support of your response.
ANS:- Yes. This is because by and large the PRS software has been so efficient that even after almost 10 years and spread of this work on about 2000 terminals all over India, there have been very few changes in the basic logic. Further the implementation process at all places has been
similar with some few changes to suit local needs. And it has been accepted by passengers all over India.

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TRANSCRIPT OF INTERVIEW WITH Mr. M.R. RAMAKRISHNA  
(Joint Director, Directorate of Operations Information Systems, Railway Board, New Delhi)

Q. No.1: - Please indicate the post in which you were associated with this project and briefly indicate the work responsibilities you handled in this post.

Ans:- I worked as Joint Director O.I.S. under Mr. N.C.Gupta as my Executive Director. My job was helping E.D. OIS in policy works regarding computerisation on I.R. Our major area of thrust was selecting projects for computerisation, selection of systems, selection of appropriate software and organisation for such projects, working out cost benefit analysis for the same etc.

Q. No. 2) How did your department conceive of computerisation on such a large scale at that time ?

ANS:- In 1978 - Railways set up a Task force for deciding suitable work areas in railways for computerisation. This task force after a detailed study recommended two major work areas for computerisation namely Freight Operation and Passenger Reservation. Railways accepted the recommendations & went ahead with deciding methodologies for the same. Another committee was formed in 1981 for this purpose under chairmanship of Mr. Gill. This committee visited Europe & U.S.A. to assess the position there in these two areas and suggested common hardware for both pass & freight computerisation by importing the entire
system from abroad. But by that time the focus was on Indianisation, therefore this committees' report was not accepted. In the meantime at the World Bank' insistence a separate directorate of OIS was set up in RB & asked to examine Gill committee's recommendations. After scrutiny of this report and since there were further developments in software scenario another team went abroad visiting U.K. and Canada amongst other countries. This committee on it's return recommended that while for freight computerisation a proven system from abroad should be imported and modified to suit our requirement and for passenger reservation the system should be developed indigenously as we had enough capability in India for this purpose. We therefore planned to float global tenders. In the meanwhile CMC had taken up a World Bank Funded project at Hyderabad jointly with railway officials known as "Project Interact" in which they had developed a prototype for passenger reservation. This was demonstrated by them to DOE the dept. which had to clear all computer projects taken up by any government dept. in India. DOE therefore recommended CMC for this job & therefore global tendering for passenger reservation system was dropped. This is how this work was taken up by I.R.

Q.No.3) How was the modus operandi for computerisation of this work activity which is spread all over the country, decided upon? Was any reference model selected for this project? On what considerations was this decision taken?

ANS :- Initial idea was to have system ready by 1982, so as to be available for Asiad which was then being held at Delhi. The project had been
sanctioned in principal by then, so it was decided to take up offer of CMC as it could save time to start it at Delhi as a pilot project. But there was no blue print developed till then about further expansion of same in India as number of senior officials in the R.B. including the then chairman were not sure about the success of this project. Infact a number of them were hoping that it does not succeed.

We did not select any reference model from abroad as none were found suitable for our needs. Further CMC's proposal for the prototype was found acceptable and they had offered to take it back if it did not succeed which also suited us as CMC could always be blamed for it if it did not succeed.

Q.No.4) Was a core team formed for defining the scope etc. of this project? Were the senior decision makers at ministerial and board level involved at any stage? What sort of support or otherwise did you received from them? In what way their involvement or lack of it affected the effective implementation of this project?

ANS :- Railways setup a core team to liaison with CMC & to develop functional specifications for the software to be developed by them. This core team consisted of railway officers and staff from Northern Railway with computer background and also having adequate knowledge of the manual system. For the core team complete support was given by OIS directorate - who in turn could approach respective board members & the chairman any time i.e. communication channels were always open. There
was total support from the then Railway Minister Mr. Madhavrao Scindia. In fact he took more interest and gave full support sometimes more than some of the members of the Board. His involvement really helped in speedier implementation of this project. From 1982 - 85 the project was going very slow as procurement of hardware from US had met with some problems at inter govt. level. It really got impetus when the Mr. M. Sindia become the M.R. & set up tight targets & started pursuing them. He even approached the US Ambassador for releasing the computer required for the system even when our own chairman had cautioned him against it. Once he started chasing the members things really started moving. Till then no doubt the communication channels to the top were open, but the 'push' was lacking as computerisation was considered more of a fad than a thing of importance like day to day management of Railway's operations. It is only when the minister set the priority right that everybody went after it. Further it was the then PM Rajiv Gandhi's directive and interest in computerisation which motivated the minister.

Q.No.5) What data was collected for conduction of a cost benefit analysis of this project? Was any reference model selected for this project? On what considerations was this decision taken?

ANS: No such analysis was done at that stage since it was decided to take it up as a passenger amenity work. The initial cost of the project was estimated at Rs.8 cr. Today we may have spent over 100 cr. on it. But at a later stage a social cost benefit analysis was conducted at Delhi and it has shown excellent returns on this project apart from the tremendous goodwill it has created for Railways.
Q. No. 6) Was the development of software handled by your department or was an outside agency involved? What in your opinion have been the advantages / drawbacks of this approach? Was any other approach possible?

ANS: CMC handled the development of software with constant interaction with core team of Railways. This approach had the advantage of speed & cost saving as Railways would have had to spend more time & money in selection & training of separate work force etc. for this work as they had no previous expertise in working on VAX machines which CMC had. The drawback of this approach in my opinion is, today for even small changes etc. in the procedures, we have to approach CMC & pay them whatever they demand. Railways are neither fully taking over this job yet nor having full trust in CMC or CRIS with the result errors & garbage is now coming on this system as I have seen it on the terminal now provided in the Railway Staff College, where I am presently posted. The study team had envisaged complete computerisation in 4 to 5 years, but actually it has taken much longer. This work started in 86 but still it is in stand alone mode. Every year we are adding more areas to different systems. It has received this thrust because public has accepted it fully. They see it as the best thing that has happened to railways since independence. So enlarging the scope of this work by spreading the terminals at more and more stations, which is an easier option than the networking, has been preferred. But now the time has come when people have started talking about networking etc.
At the time of software development - we should have associated a team of young officers with CMC who by now would be well conversant with this work. a) This did not happen as the development work was done by CMC at Hyderabad while the project team was at Delhi & number of them were not very keen about visiting Hyderabad.

Q. No 7) What type of motivation was offered to various tiers of management involved in this work? Has it achieved the desired results?

ANS: - No separate motivation in form of special pay etc. was offered except for some out of turn promotions to some staff in N.R. as data base administrators. However in my opinion following feature of this system helped motivation.

a) Most of the staff accepted this system as it upgraded their status and improved working conditions.
b) At Supervisory level the chance to do something different was a great motivation.
c) Middle level managers found an assured posting in Delhi.

Q.No.8) What were the major difficulties experienced at your level during the various stages given below especially from the 'management of change' of the work culture of the organisation? How were these overcome?

a) Planning and sanctioning of the project.
ANS:- Attitudinal problems of seniors was a major hurdle. Skeptic were rampant. However the pilot project Delhi was cleared because of relatively
smaller inputs and a ready scapegoat in form of CMC in case of failure. But then the force from top and successful implementation of this project silenced the skeptics.

b) Development of software.
ANS:- There were no major difficulties that were projected by the core team to R.B.

c) Planning for implementation and actual implementation.
ANS:- As Joint Director I was not involved in this activity directly.

d) Final change over and running of this project.
ANS: At times we received two opposite views from two senior officers of same department of Northern Railway leading to a situation that soon after the introduction of this system at New Delhi, one officer claimed positive results while his senior claimed it to be a failure. At New Delhi some suggestions of the then CCS were not incorporated by the project team with the result two months after inauguration the CCS sent a report through GM saying the project has failed and so CMC should be black listed. Here the role of OIS directorate proved crucial in that we carefully studied the objections & made a presentation to the Minister bringing the anomalies in the observations of the CCS which had been forwarded to us as official viewpoint of the Northern Railway. The minister not only accepted our observations but made the general manager NR responsible for making this project a total success.

Q.No.9) In your opinion has this project achieved the objectives conceived and set out at the beginning? Please give brief reasons for your observations.
ANS: The major objective of improving quality of service has been achieved. But I feel the potential of using availability of berths which are likely to fall vacant enroute has not yet been exploited like German Railway. Further the linking or networking has also not progressed well. Most of the manual systems were transferred as they are into the computer system, the spin off is lot of unavoidable overheads in the software but the benefit is easier acceptance by staff as the work culture has not changed.

Q.No.10) If you were to be associated with similar project again what would be the aspects / areas especially falling in the area of 'management of change' you would like to change or approach differently and why?

ANS:- i) The whole implementation planning has been piecemeal, we never had an overall idea in the beginning, so we started a pilot project which succeeded beyond our expectations so we kept on introducing it at other places in ad hoc manner without further thought, at Mumbai, Calcutta & Madras. When we started developing new system at Hyderabad we were forced to go for indigenous machine, the Cyber( Medha) which is a monumental failure & lying idle.

ii) None of the VAX system is fully compatible with each other as each was brought by respective zones, and no thought was given to the ultimate aim of networking.

iii) Railways should have had more active participation in software development. Earlier it was done by CMC, now it may be CRIS but I feel Railways should have had stronger participation from beginning by
including some young group A officers in this project who then could have developed appropriate team of railway men for this work.
ANALYSIS OF THE FEED BACK FROM RAILWAY PERSONNEL
OTHER THAN THE STATEMENTS GIVEN IN THIS ANNEXURE.

The names of the persons whose feedbacks have been received are
given as under:

1. Mr. Vijay Kapoor, Chief Project Manager/Mumbai
2. Mr. Ashok Awasthi, Chief Project Manager /PRS/Mumbai
3. Mr. S. K. Nanda, Dy.Chief Passenger Manager /PRS/New Delhi
4. Mr. I.J. Malhotra, Dy. CPM /PRS/New Delhi
5. Mr. K. Ahuja, Dy.CPM/PRS/New Delhi
6. Mr. S. C. Jetley, SPM/PRS/Mumbai
7. Mr. S.N. Nanda, Reservation Supervisor, New Delhi
8. Mr. Saigal, Chief Reservation Clerk, New Delhi
9. Mr. S.S.Verma, Reservation Supervisor, New Delhi
10. Mr. U.C. Mathur, Asst. Programmer, New Delhi
11. Mr. Gopal, Console Operator, New Delhi
12. Mr. Ghosh, -do-
13. Ms. Meera, Enquiry cum Reservation Clerk, New Delhi
14. Ms. Anita Choudhary -do-
15. Mr. V. Nikhale, Asst. Reservation Supervisor, New Delhi
16. Mr. V.K. Anand Head Booking clerk, Mumbai
17. Mr. Divakaran Enquiry cum Reservation Clerk, New Delhi
18. Mr. Kutty, Chief Reservation Inspector, New Delhi.

( The designations indicate the posts on which these persons worked in this project )
The first 6 persons being Managers were given Questionnaire-III while the remaining were given Questionnaire-IV.

A) The analysis of the questions and answers received from the staff and supervisors indicates that:

i) most of them were selected for the PRS as they had some prior knowledge of the related subject or proficiency in their allotted work in the old reservation system.

ii) A majority of them have indicated that they had enough knowledge of working in the manual system.

iii) As regards nature of training and its adequacy, the feedbacks indicate that the course run by CMC and departmental course were quite useful for their requirements.

iv) As regards the qualities that were looked for selection of other staff, majority of them described, it as “sincerity and hard work” as the major factor for selection.

v) From the purview of the questionnaire as to what incentives were provided for this work and whether the result would have been different without such an incentive; majority of them have replied that no incentives were provided to the staff in this project and it would not have been made much difference even if some incentive was given because of the generation of self-motivation in the staff about the new change which became the prime motive. Some of them have stated that some sort of additional wages could have made some difference.

vi) Since in this project, the new change had well defined targets and offered positive reliefs to the workers, majority of them did not face any problem in motivating their colleagues. However wherever they faced
some problem, they offered guidance regarding benefits of the system to the unwilling workers, thereby overcoming such resistance.

vii) As the new system offered number of benefits to the users, *practically* there was no resistance from the users and whatever was there, was overcome with open communication.

viii) All of them by and large have agreed that as the new system was run in parallel with the old system for a definite period of time and gradually the entire manual system was computerized in irreversible manner, it had a positive impact on the success of the PRS project.

ix) Further the feedbacks also indicate that as the new system had minimum unavoidable changes as compared to the manual system, it was easier for this core group to convince their colleagues about quick acceptance of this change.

x) Another clear factor emerging is that the new system did not in any way upset the then prevailing "line of command" in the organisation with the result no unnecessary conflicts were generated.

xi) The attitude of the juniors and peer members towards this project has been evaluated as "hostile in the beginning" by half the persons while other half have evaluated it as 'nil'. The resistance has been tackled by training and motivation and in some cases forcing the persons to work on the new system for a period of time, thereby breaking his resistance.

xii) All of them have evaluated this change as a successful one because it has benefited every one concerned, namely, the passengers, the staff as well as the Railway Administration.
B) The summary of Questionnaire-III for field management indicates that

i) Formation of a core team consisting of middle level managers and staff connected with this work for developing the new specs for the project; methodical planning of the process of change and systematic execution of the change has contributed to success of this project.

ii) The thought given to the selection of team members especially from the staff has contributed to the success of this project.

iii) The means adopted for motivating the staff such as open communication, explaining the benefits of the system and giving enough initial exposure to the core team with the vendors and following it up with continuous inhouse training programmes have helped in quick change over.

iv) As the management of this change was done in this manner, there was no serious resistance from any quarters in the implementation phase and conflicts arising on day-to-day basis were tackled by the team leaders, through repeated group discussions.

v) As the teams received full support from their seniors, there was no problem in handling issues related beyond their powers and quick decision were obtained by chasing the issues with other departments etc. by taking personal interests rather than relying purely on administrative channels.

vi) The factors which have contributed towards the successful management of the change of this project as indicated in the feed back are:

   a) Full dedication of the change team.

   b) Success in developing confidence in the staff.

   c) The new system offering positive improvements, to all connected
with the system.

d) Success in getting all round positive support from all.

e) Gradual but irreversible change.

f) Active and keen interest taken by the top management right up to the Minister's level.

g) A well coordinated effort offering positive benefits to all, that is the users, the workers and the administration.

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ANNEXURE III

FEEDBACKS RECEIVED FROM CUSTOMS
Transcript of Interview With Mr. Asthana (Joint Collector Of Customs, Mumbai Custom House)

Q.No.1) What were the circumstances based on which this project was selected?

Ans :- The customs department selected the project of computerisation of import & export procedures for following reasons:-

1) The volume of import & export in seventies had increased tremendously & it was becoming impossible to control the operations manually as the number of cases of import in Mumbai itself was coming to 1100 /1200 bills of entries per day at the docks & about 800 at the airport - which meant scrutiny of 4000 to 5000 licenses, examination of related documents and the goods etc. Although a large force of 75 / 80 Group A officers, 250 Assessors & 300 / 350 inspectors were there yet they could not handle the work load effectively. There was no MIS available to senior officers to monitor the progress of each bill of entry or locate a particular consignment quickly.

2) India's Foreign Trade Statistics is compiled from the data received from various customs houses & air customs. Manual compilation of such large volume of documentation; its' classification as per RIT codes to be done code wise etc., resulted into a delay of 7 to 9 months. Such completed statistics was sent to Director General Of Commercial Intelligence & Statistics at Calcutta from all over the country. The documentation so received virtually weighted in tons. This was further manually sorted
leading to some reports being found illegible, some damaged in transit etc.. Thus the statistics which was generated by DGCIS out of this was not fully accurate and at least 1 to 2 years old. Thus India’s export / import policy changes in custom's tariff etc., were based on this data which did not reflect the correct picture. The figures given by RBI, DGCIS & Custom to the Finance Ministry therefore never tallied.
3) Since the number of restrictions, exceptions, rates of import duties etc. had increased so much that for internal purpose of customs uniformity in imposition of duty all over the docks and airports was important to avoid unfair trade practices in this respect was becoming crucial.

Q.No.2) Considering the fact that your department has had mostly manual systems since inception how and why did you select this particular activity for computerisation?

ANS :- This activity was selected for following reasons:
1) We were having all manual accounting procedures in customs. The cash section in custom houses was open only from 10.00 a.m. to 2.30 p.m., later on they kept working till late in the night for counting of cash, tallying of cheeses with Chileans etc. This led to the situation that the by the time the importer had got their documents assessed & ready for payment of duty, the cash office was closed for the day. If this happened on a Friday, followed by Sat & Sunday, the importer lost three valuable days in removal of consignment at no fault of his. This was leading to severe protests from users.
2) Due to continuous increase in workload all around and plethora of regulations under which the system was functioning induced some
unscrupulous importers (or their agents) to commit frauds by stamping the Bill of Entries prepared by them with authentic looking rubber stamps etc. along with false signatures. Such documents were directly present to the cash department, for payment of import duties. In a place like Mumbai where there were 75 / 80 class A officers & over 250 Assessors having the authority to sign the Bills of Entries, the cash office at times found it difficult to verify the signatures in every case and accepted these bills if the whole thing looked authentic. Thus a party could prepare a fraud Bill of Entry, pay less duty & remove the goods with nobody really knowing what had happened, as such bills may not even go to audit, as in any case they had not followed the proper channels.

Q. No. 3) How did your department conceive of computerisation on such a large scale at that time?
ANS :-The revenue from custom itself was 25 to 30 thousand crores while the estimated cost to improve the system was only 70 crores, so we took up the project. This project started after some of us were sent abroad. I was sent to Copenhagen for advance course in EDP in customs, from there I did a stint at Heathrow, London to understand nuts & bolts of such a system. At that time they had a system called ACP 80, which is still continuing Mr. Ramnan was sent to Bath for this purpose. This was all in early 83-84. On my return I was given the job of conducting feasibility studies of the Bombay customs with CMC. So we studied the largest custom house in India i.e. Mumbai with a view, that if the computerisation worked in such a complex environment it could work anywhere else. We took 10 month to prepare a detailed department, by department., table by
table study every aspect of both import & export manual procedures, documentation involved, cash accounting etc. We came up with a 500 page feasibility report which was very exhaustive. It was submitted to Govt. of India by CMC in Feb / March 85 after approval by collector of customs, Bombay. Govt. therefore said it is a very ambitious plan & therefore our dept. should take up first the import assessment procedure at Bombay as a pilot project.

By the time this decision was taken I was transferred from Bombay to Delhi to the ministry of Finance, where I was asked by the then Chairman of CBCE Mr. Dutta & the revenue secretary Mr. Vinod Pande to handle this project on all India basis from Delhi. I was to handle all its aspects such as software philosophy, hardware acquisition, site preparation, implementation monitoring, financial sanctions, import of hardware. They said it now my baby. I had no infrastructure what so ever. This was in June 1985, I had to put in daily 14 to 16 hours of work 7 days a week. All the procedures such as every proposal going through committee of secretaries etc. had to be followed, even though it was a limited tender. By the time all this was done, it was Oct. 85 by which time we had firmed up on the hardware, the vendor, the software developer, the software package to be used. Some screen formatting was also done on a P.C. We had selected Sperry Univac Machine for our system. We chose Sperry-Univac then as it had the best networking features in the world both WAN/LAN. All important airlines, U.S. air force etc., were using them, they had excellent architecture & powerful front end processors. It was a fail safe system, dedicated lines were provided at all places with one connection through microwave & other through satellite with automatic
switching facility. Enough redundancy has been provided for all systems right from UPS, stand by D.G. sets to console panels.

CMC who had collaborated in development of functional specs., was not given the job of software development as they gave a time estimate of four years. for development of software which we did not have. ORG did the software development with some help from Sperry Univac experts. DOE was also associated with the development. As far custom department was concerned. I was the bridge between field staff & software development teams. In Jan 86, the hardware had still not arrived but we had already developed a major amount of software on tapes & floppies including dummy data, and programs in COBOL for duplication. We had finalised Sperry-Univac machine for our system which however had still not arrived, so we approached M/S Univac U.S.A. for making a machine available to us anywhere in the world for testing our software. They offered us a machine available at Singapore for this purpose. A team of 4 / 5 persons including a representative of DOE went to Singapore, where we worked for 12 Hours a day & ported the entire application on Univac Machine, created large data bases to test the same. Debugging was done, to achieve a response time of 5 / 6 sec per query, for a data base of 6 months that too on a super mini system. DOE therefore gave clearance for this software and site preparations were started in earnest. By this time the machine had also arrived and so by July 86 the pilot project commenced in Bombay. I had named it ‘Customs Assessment, Retrieval & Evaluation System’ or CARES for short. Data entry operators were recruited & work started. Mr. Nagarkar managed at Mumbai the infrastructure installation & day to day implementation as the system manager, first of the pilot project &
then the main system. He was our man in Bombay doing the nuts & bolts. My job was to conceive the software, develop it & do implementation planning not only in Bombay but whole of India, procurement & import of software. In Bombay terminals have been provided at docks where physical examination of imports are done. The major grouping of terminals is on 1st floor of customs house where all assessment are conducted.

After 6 months i.e. by Jan 87 a review of this project was taken up & it was declared as successful. I was now told to extend it all major docks & airports in the country. By middle of 87 the ordering of hardware etc., was completed for all centers & by end of 87 all major custom houses at ports & airports were running this software on schedule. We had created 4 Zones & appointed a Joint Director Computers for each. It was his job to execute the implementations & give feed back to the board on progress etc. Mr. Nagarkar was in charge of the system at Bombay for a very long time, Mr. Ramnan implemented the system at Madras. He joined in 1987 after completion of his work in rewriting of customs & excise tariffs. Calcutta was handled by J. K. Batra.

Q.No.4) How was the modus operandi for computerisation of this work activity which is spread all over the country, decided upon ? Was any reference model selected for this project ? On what considerations was this decision taken ?

We decided to go for pilot project at Bombay docks & then to go to other centers. There was no particular model of any foreign custom department selected as such but we did adopt some things from here and there. But the
retrieval technique developed for pulling out relevant information from the
data bank that is the funneling technique was our own. This was done as we have totally different system of working, most of the foreign countries have VAT system while we have separate customs & excise departments. The rate of duty abroad is very low & variation in duties is very narrow.

Even though the hardware up time on these systems has been of the very high order of 99.5%, most of the systems in use today were bought in 1986/87 and will become obsolete in a year or two. In fact M/S Sperry have advised us, their inability to provide any spares for these in the near future. The system was introduced at Bombay airport little later. Both systems are now hooked to each other. There is a star network having central data base in Bombay. We had earlier given 100% redundancy at most of the places but with ever increasing load on the docks and airports the quantum of live data that can be kept in the memory has increased as the result only 90 days data is available on line. The projection in estimated growth in number of transactions handled at Bombay & Delhi Air cargo terminals have been proved wrong. We had projected a growth of 20% per annum whereas the actual growth in work load has been 80% making these systems redundant very soon.

Today with the introduction of 286 & faster chips the scenario has changed. The next step now being taken is to go for the concept of EDI. Electronic Data Interchange. What we are doing now is to pass on the basic work of data entry for the Bill of Entry to the customer, which in present system is a bottleneck. There will be now service centers through which the new system will function. The new software system is called ICES. It will finally replace CARE everywhere. The pilot project is under
implementation in Delhi, under the charge of Mr. Ramnan. I represent the Indian Government in the world customs organisation three times a year in the advisory groups for EDI. and therefore even though I am at present in Excise I keep, in touch with the progress of this system.

Q.No.5) How did you plan and manage to involve the various agencies related to this activity such as unions, users, other related govt. departments etc. involved in this process?

ANS:- 1) Other than our dept. we took help of CPWD for setting up the infrastructure. CPWD gave us fairly good support both at Bombay & Delhi. The sites were delayed by 4 to 5 months but they did a good work. In EDI CMC has been given the job of site preparations.

2) The custom house agents did not want the 'importer' i.e. his client to get an accurate and up to date feedback on the real status of his goods. If that happened he could not ask for money from client for so called "removal of obstacles". The custom house agents' habit of using wrong-information or inadequate information was overcome by daily posting the status of all Bills of Entries available in the system on the notice board in located in the main hall in Bombay Custom House. Every day practically the entire walls in this hall were full of printouts displaying this information, which an interested party could now obtain everyday. It meant wastage of lot of stationary but it also gave the importer every detail directly. If some one still approached an officer the officer now could enter the relevant custom. clearance code which was unique for each bill of entry & find out the status. The custom house agents were also tackled on logical plane. Their associations were told to run training programmes for their CHS to
learn the new systems, the customs offered to subsidise them. Some such courses were also run. This thus helped in overcoming their resistance substantially.

Q.No.6) What strategies were devised and used to handle the profound impact this project would have on the work ethos of your department?
ANS :-i) We had planned heavy training schedules, right from the data entry operators to members of our Board. All done in house by ORG.
ii) The cadre management for this entire work was approved by DOP. Special pays were given at all levels. iii) For over an year there were parallel runs i.e. both manual & new system remained in operation. It did lead to chaos at times, but I feel that that is a price one has to pay for modernisation. There is no solution to it. The main assessors had the terminals on their table. We had not planned for terminals for every assessor as it would have proved very costly in 1986. During implementation there was a big back lash to revert from on line to batch. We were under tremendous pressure both from customs house agents & staff. The complaints came in form of too much delay in parallel runs. It was very difficult to make people accept computers in customs, One reason for it was vested interest. The appraisers did not want to follow the new system as their power of discretionary authority was substantially reduced. We were lucky that our bosses understood our final objectives clearly & supported us. Otherwise had we gone to batch mode it would have been death of CARE. . It was Herculean task to continue but because of unstilted support & push from top bosses that the implementation was pursued. Meetings were held with the staff associations as well as users. I
was the main person liaising with them. All of them were told that if they had any logical difficulties while working with the new they will be solved. Any illogical problem had no place in the discussion. Of course there was no point in directly harping on the two reasons just mentioned as in my mind it is the worst way of managing human beings. So I went on the logical plane. I told the assessors that the new system gives them security by way of indicating 'precedence' from the database for enabling them to take a proper decision, so even if they gave a wrong decision based on the information available in the computerised database no body can attribute malafides to their decisions. The system may be wrong, the database may be wrong but no body can call them wrong, thus their salary and pension is safe in the new system. In the manual system it was not so their decisions were always susceptible to malafides. The second was introduction of concept of concurrent audit. In manual system it was "post facto" audit, which was a thankless job. So to increase speed of clearance we decided upon introduction of concurrent audit. In this system as soon as the assessor has cleared a Bill of Entry, it goes to audit table where the auditing assessors assesses it independently of the first assessment and if both match the BOE is cleared for further processing. If differences crop up the case is put up to higher authorities until a decision is obtained. So it was told to them that in the new process almost half of them will do the concurrent audit or second assessment. Thus the second assessor will have as much importance as the first assessor, thus in the new system while deleting the drudgery of working in post facto audit as now it was a concurrent job. Thirdly they will get a very modern air conditioned environment for working. Fourthly, In case they have any problem in
assessing a consignment they after due permission from system manager can call for data from customs houses from all over the country as all centers were going to be inter linked to assist them in decision making. Finally it was told to them that whatever logical objections they had they would be solved but any objection not falling in this category are likely to be looked upon as falling in the realm of "vested interests" by the top bosses in Delhi which might create problems for them so they should either raise logical difficulties or follow the new system. This approach worked.

iv) The philosophy behind our implementation plan was in government especially unlike private enterprise the chance of an automated system succeeding is more if it is a real time - online system. Batch processing always leads to delays and inaccuracies. Hence CARE was designed as a real time - online system. There was lot of resistance from diehards who protested against this quantum jump in technology, but we stuck to our guns. Fortunately we had full support of our then bosses i.e. chairman CBEC & Revenue Secretary. I was supposed to report to chairman twice a day and could walk in their room at any time if the need arose. The project was given Red Flag / Urgent priority which meant disposal of the file on the same day. Once Import Assessment went on line we also introduced Export Procedures Package at Bombay & replicated it at all other centers like Madras, Calcutta, New Delhi Etc..

Q. No. 7) What in your opinion were the features unique to this project?
ANS :-During the preparation of this report our biggest problem was how to retrieve data from a large database very fast. We could not allocate any unique coding system. The foreign invoice was the only correct description
of the goods on which the analysis could be based, so we hit upon the idea of a 'funnel system of retrieval of data' through certain string searches. The system logic was so designed that a correct record could be retrieved in 1 to 2 min.. The parameter for this search was a product let us say 'Mercedes Benz 200 D A/C Saloon Car Automobile'. The concept was to brake this description up in smaller pieces in such a way that you start the search will start from the 'Generic' name & move towards a particular specification. So here the sequence of generic words would be Car/Automobile - saloon - Diesel - Mercedes Benz 200. So we decided that it would be possible to select some keywords in each description & go further to the minor specifications, such as brand, model so as to pinpoint the product & link it to data for similar imports in the past. The reason for this was for the same goods, the tariff remaining the same, the duty assessed should also be same. Even the value for ad-valorum duty should be same.

Q. No. 8) Please enumerate some aspects which you feel caused a major influence on the approach, development and implementation of this project?

1) In my opinion, what you want to get done can get done if you have some discipline and the will to do it. If there is an adequate pressure and support from top, things move. Therefore during the tenure of chairman Mr. Datta by third year the delay in compiling statistics for Min. of Commerce & Revenue Secretary was drastically reduced while reliability went up.

ii) The parallel run was going on for almost 2 years. The people got used to the system in this time automatically. It was for the top bosses in Board to decide when to stop the parallel runs, but as direct revenue loss could
result In case of some mishap in the system perhaps nobody took that
decision. I feel these runs were extended for too long a time. It could have
ended in six months to one year. I lost touch with this project. By end of
1987 as I was transferred to excise department. I designed and
implemented the system and made it work. It was the job of my successors
to go further from there as I was asked to develop similar systems for
excise department which is a much bigger job. There are 9 custom houses
while in excise there are 36 collectorates. Here everything is in batch
mode therefore the approach is entirely different. This has however got
bogged down as in CBSE there is no separate directorate for EDP.
Someone like me had to handle this work in addition to ones' normal
duties. Mr. Ramnan while implementing ICES is doing is doing this work
in addition to his duties as Joint Secretary, Ministry Of Finance. In excise
where ever the principal collector is taking interest the work goes
smoothly, the moment he is transferred & the successor is not having equal
interest things slide back. In CBSE member budget is in charge of EDP in
customs & excise in addition to the main work of modification of custom
and excise tariffs which in itself is a full job, thus EDP gets neglected.
While in Australian system they have a member computers where as we do
not even have a separate director for this work.

Q.No.9) What type of motivation was offered to various tiers of
management involved in this work? Has it achieved the desired results?
Could any other approach have been more effective and Why?
ANS :-i) Special pays were given at all levels varying from Rs.500/-per
month to junior administrative officers to Rs.250 per month to assessors
which was in those days for those who were serious minded people a good
motivation.

ii) At my level lot of respect by others & constant contact with the policy makers right up to Finance Minister was a motivation by itself. Total support from my superiors and ready help when needed was also a great help. No other approach is possible except may be by offering posting of ones' choice after successful complementation of such a project.

Q.No.10) If you were to undertake similar project again what would be the aspects / areas specifically falling in the area of 'management of change' that you would like to change or approach differently and why?

ANS :- Firstly the software & system design should be such that there are in built pressures to perform.

Secondly, the incentive package to staff should well be thought in advance & should be announced as such to pick up good talent & avoid subsequent complications. Some other incentives such as a free transport from staff colony to EDP center, etc. so that they enjoy a special status can further add glamour to the work.

Thirdly continuity of staff and officers during a project is very important to maintain the tempo of work.

After 1989 the whole team at top changed with the result the cohesiveness and speed shown earlier was lacking in further progress of this project.

Q.No.11) How was two way communication maintained.

Daily contact with my system managers at every center was there. If there was any problem we could not solve I took it to the chairman who gave the decision. Our system design ensured that the computer system will replicate the manual system as we had prepared ourselves for extended parallel runs, as "revenue loss" was the risk. The system design thus
compromised on efficiency. Delay was mainly due to lack of "administrative control" from time to time.
Transcript of Interview Of Mr. P.R.V. Ramnan, Joint Secretary,
Department Of customs, Ministry Of finance, Govt. Of India

Q.No.1) Please indicate in what capacity you were associated with the CARE project?
ANS :- I was posted as Systems Manager Madras in Nov.1987 and worked in that capacity up to Feb.1989. The computerisation work started at Madras in July 1987 and by March 88 I had implemented all modules of this software, with the help of ORG engineers.

Q.No.2) Please tick mark the relevant choices given below in which you shared the responsibility or made vital contributions while working on this project.
a) Study of manual system to define data specs.
b) Selection of appropriate supervisory and field staff for initial development and testing.
c) Setting various objectives for the software so as to make it capable of handling day to day problems.
d) Testing of the software and obtaining approvals for departures from existing procedures from concerned authorities.
e) Establishing dialog with fellow managers, supervisory staff, unions and users.

ANS :- I handled work related to c, d and e
Q. No. 3) Were you managing these activities alone or was there a team?
ANS:- There was a team. I had one system analyst Mr. Kannan and three
data entry operators, Shanker, Narayan, Sudha and Rao with me.

Q. No. 4) Was the approach adopted in managing these activities correct?
Was some other approach possible for increasing effectiveness of this
project?
ANS :- No. There was no planing or coordination between the various
places in India where the software was being implemented, with the result
progress at each center was in isolation, there was no process of sharing of
each others' experiences. The implementation was purely left to the mercy
of each team with practically no help from Delhi. Each team kept on
developing various modules on their own.

Q. No. 5) How did you motivate the staff under your charge to take
genuine interest in this activity?
ANS :- i) I gave them problems and asked them to find solutions using
their creativity. This acted as a challenge to them.
ii) Honorarium was given for good work done by the team.
iii) Good chit and commendation letters were given to staff who handled
the system properly.

Q. No. 6) Did you face any resistance in this work from your staff? How
did you overcome the same?
ANS :- There was a basic resistance from all appraisers (AO) as this system
was not designed to reduce their work but added more work. It only helped
them in respect of providing precedences. The A.O. were doing all work manually and then passing it on to the Data Entry Operators in computer cell for data entry. This problem could not be overcome.

Q. No.7) What type of feedback system did you set up for effective monitoring of the work entrusted to you?
ANS :-a) Through daily reports on the progress of implementation which consisted of works like creation of data base ; and utility runs etc.
b) Weekly meetings were held with all custom officers and appraisers.

Q.No.8) How did you manage the problems related to your staff which were beyond your powers of sanction?
ANS :-This system suffered from a severe drawback in that it needed manual feeding of information every now and then from the appraisers which they were reluctant to perform. No body could solve this problem as revenue was involved and the pressures of work resulted in continuation of manual system.

Q.No.9) How did you manage to incorporate changes suitable to computerisation but demanding changes in existing codes and procedures?
ANS :- No conscious attempts were done except whatever changes that were needed due to change in policies etc.

10) What problems/difficulties were faced by you during planning and implementation of
this project from:

i) Supervisors / Junior Officers
ii) Field staff

Total reluctance to use the system as they could not get away from the manual inputs. Further an additional tier of data entry operators was also added which had a dampening effect.

iii) Customers :- They had to now look after and chase both the appraisers and data entry operators leading to extra efforts and wastage of time on their part.

Q. No. 11) Did you face any resistance from staff or users which was more of a hypothetical nature rather than practical? How did you tackle the same?

ANS :- Some queries regarding aspects such as re import of items after repairs etc. were raised. These were discussed with them thoroughly and sorted out.

Q. No. 12) Do you feel you got adequate support and guidance from your seniors for effective execution of your responsibilities? How did you manage the situations where such support was late in coming or was not available?

ANS :- There was adequate support from top but no guidance. So we had to sort out technical problems by mutual discussions with other location heads or ORG team. The ORG team gave us excellent help.
Q. No 13) How did you plan the training of your staff? Was it adequate? What steps did you take to motivate the staff for training and later working on the system?

ANS :- The data entry operators were given two weeks training and the appraisers were given 1 week training. A separate training of 2 weeks was given for the MAPPER module for anyone who volunteered for it. In addition to this those who showed interest were also trained with outside agencies. But very few supervisors opted for it. Incentive by way of special pay was given to those who completed the training and worked on the system.

Q. No.14) What in your opinion would be the factors which have affected the process of management of change in this project?

ANS :-a) The system had excessive manual intervention leading to great reluctance to do away with the manual system.

b) Even after full implementation of all modules parallel runs were not done away.

Q. No. 15) Has this project achieved the objectives it was supposed to achieve? Please give brief reasons in support of your response.

ANS :- No. This project had a major drawback in that on line creation of the basic documents required for processing was not initiated by the customer with the result the appraisors had to resort to both manual checking of the bills followed by computer data entry. Capturing of the document was done part by part with the result the necessity and benefit of going 'on line' were never realised. Work in this system could proceed manually while computer data entry could be done later. So while this
computerisation generally assisted in improving off line reports like periodic statistics etc., it really did not improve the working environment in custom dept.

Q.No16 ) What were the circumstances based on which the ICES -EDI project was selected?

ANS :- In addition to the reasons mentioned in my answer to Q. No. 15 there have been certain developments as well compulsions after the implementation of the CARE project. Firstly the vendors M/S Sperry has informed us that very soon they will not be able to supply spares etc. for our existing hardware. Further now the trend is for open architecture, so the proprietary models like the ones we have in CARE are getting faced out. All over the world now the E.D.I. system is coming in vogue and in the meanwhile our own custom tariff has been greatly simplified so we thought this is the right opportunity for us to follow suit. The system now proposed includes feature such as On line Assessment, Electronic handling of documents thereby reducing paperwork by bringing in other EDI agencies such as banks, cargo handling agents, exporters, importers, other government department such as DGFT.

We first intend to start the project at Delhi, develop all the new systems and implement them and then transfer it to all other important points in India. The existing system will keep working till then as it has to compile the various statistics required by government. We have therefore set up the new system in a new building at Delhi cargo complex and plan to complete the work here by end of 1995. Thereafter we will take up the air cargo complexes at Bombay, Calcutta, Madras and Banglore. The third phase would be implementing this at the less busy ports in India such as
Kandla, Navasheva, Vizag etc. We propose to take up Bombay Custom House last as it has a very large computer system capable of handling the workload at least for a few years more. And by the time we reach Bombay the system would be well established elsewhere.

The pilot project at Delhi has already started working. We have implemented the Import Module at the new Custom House at I.G. Airport in which every appraiser is having a terminal and is to work only through this system. The bill of entry is fed in the system by the importer or his custom handling agent through either a dedicated terminal or service center manned by CMC. The hardware for this system consists of HP 9000-860 machines each capable of supporting 128 terminals. Soon we are starting the Export module for which a separate system is being installed. Both these systems will be linked to each other. The duty draw back module is very unique one in which we are asking the PNB our banker to take up the responsibility of debiting and remitting various amounts from the exporters directly based on the data they will get on their terminals. In this system we expect to release the bond amounts of exporters within 48 hours of shipment of his goods which today takes more than 30 days.

The idea is to make this system as faceless as possible to minimise interaction between the appraisers and the custom handling agents. We have set up study teams at all air cargo complexes to study the existing work patterns with a view to incorporate such features of selective nature which will make the system efficient yet user friendly. None of these features are present in the existing system.

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Feed Back Form Of Mrs. Laxmi Ramnan, Joint Director Statistics,
Customs Directorate of Statistics, New Delhi

Q.No.1) Please indicate the post in which you were associated with this project and briefly indicate the work responsibilities you handled in this post.
ANS :- I was posted as Joint director, in Directorate of Statistics in Customs Directorate of Statistics under Mr. Asthana. I had One Sr. Analyst as my assistant. My work consisted of systems study of the CARE project and liasioning with other related computer agencies such as ORG.

Q. No. 2) How did your department conceive of computerization on such a large scale at that time?
ANS :- We were trying to develop some software for batch processing with the help of NIC. Since customs statistics was also falling seriously in arrears our then Chairman Mr. Duty decided to go for an on line system. There were two prime objectives. First was timely collection and compilation of statistics and second was correct assessment of goods with an idea of plugging loopholes existing in the manual system. The idea was to reduce direct contact of assessors with the custom handling agents and bring uniformity in assessments all over India. This had become essential as the import tariff had become extremely complex. It was a very ambitious project.

Q. No 3) How was the modus operandi for computerisation of this work activity which is spread all over the country, decided upon? Was any reference model selected for this project? On what considerations was this
decision taken?

ANS :- We decided to take up Bombay Custom House first as it had the heaviest work, and then take up other centers all over India. We did not rely on any other model as at that time none perhaps had such complex system of tariff coupled with such high volumes.

Q. No. 4) Was a core team formed for defining the scope etc. of this project? Were the senior decision makers at ministerial and board level involved at any stage? What sort of support or otherwise did you receive from them? In what way their involvement or lack of it affected the effective implementation of this project?

ANS :- The core team consisted of only Mr. Asthana, myself and my Sr. analyst. Our team leader had direct access to the Chairman and the revenue Secretary.

Q. No. 5) What data was collected for conduction of a cost benefit analysis of this project?

ANS :- No cost benefit analysis was conducted at any stage as it was taken up as need based project.

Q. No. 6) Was the development of software handled by your department or was an outside agency involved? What in your opinion have been the advantages / drawbacks of this approach?

ANS :- The software developed was done by software experts from ORG while our team prepared the functional specs for them and tested their software. ORG still maintains this software. I think it was a correct approach.
Q. NO. 7) What type of motivation was offered to various tiers of management involved in this work? Has it achieved the desired results?
Ans. :- Special pays were given to field level officers and staff. We only had the benefit having direct access to the top boss.

Q. No 8) What were the major difficulties experienced at your level during the various stages given below especially from the 'management of change' of the work culture of the organisation?
   a) Planning and sanctioning of the project.
   b) Development of software.
   c) Planning for implementation and actual implementation.
   d) Final change over and running of this project.
   How were these overcome?
   ANS :- I was concerned with part b. Once we tested the initial programs at Singapore, the work of development and testing of various modules went on in parallel at Bombay. We kept on adding modules, while solving the problems faced by staff either by discussions or by ordering them to carry out the orders without questioning. Appraisers were never really intimately with development work.

Q.No.9) In your opinion has this project achieved the objectives conceived and set out at the beginning? Please give brief reasons for your observations.
   ANS :- As I was only involved at the initial stage of development I cannot comment upon it.
Q. No. 10) If you were to be associated with similar project again what would be the aspects / areas especially falling in the area of 'management of change' you would like to change or approach differently and why?
ANS :- As far as the work of development was concerned I do feel we did it correctly. We had a dedicated team including the software experts from ORG.

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