CHAPTER II
REVIEW OF LITERATURE

2.1 INTRODUCTION
Review of literature is concerned to the study of previous research work in the field of chosen research problem and other problems related to sugar industry. This is one of the most important components in the research process, which introduces research gaps as well as the research process to a researcher. In order to get acquaintance with the research process, to understand the research gaps in the chosen research problem and earlier research studies associated with sugar industry books, Ph D thesis, published research articles and published proceedings of conference papers were reviewed and the reviewed literature is presented under the following heads viz book review, review of Ph D thesis and research articles and conference proceedings.

2.2 BOOK REVIEWS

Utpal K Bannerjee (1987) highlighted various issues related to computer centre management, problems and solutions for an effective management of EDP centre in an organization in his published book. Author had identified various key factors in EDP centre management and in the organization of centre, staff development, system analysis and development and service support. Author gave emphasis on the job profile of employees working in EDP centers and cost evaluation of various services provided by EDP centers.

Further, author focused on the importance of security and a need for system audit.

This book is very useful for EDP managers and administrators of IT centers. [1]

Carroll W Frenzel and John C Frenzel (2004) In their published book ‘Management of Information Technology’, considered information technology from several perspectives from first line managers’ to chief executive officers’. Whole aspects of IT management are covered in six parts.

Part I deals with the fundamental role that information technology plays in organizations and discusses the management issues it raises. These chapters give
readers important perspectives on IT management through examples and management frameworks. This part develops models of planning processes and relates them to management tools, information, and organizations interacting over time.

Part II explores technology trends, information delivery systems, legislative actions, and industry dynamics. Microcomputers, mainframes, and supercomputer advances are correlated with semiconductor logic and memory trends. This part discusses advanced programming, telecommunications, and workstation systems. Part two focuses extensively on telecommunication’s value to modern businesses and discusses the importance of legislation, regulatory action, and information industry dynamics to business managers.

Part III focuses on computing environment: it describes practices and techniques that help managers to achieve success in this challenging, critical business activity.

Part IV elaborates disciplined processes for managing tactical and operational IT activities in centralized and distributed e-business environments. It develops the basis for managing customer expectations and its response to user need. This part discusses problem management, change management, and recovery management as well as contingency management and disaster recovery planning. Part four also focuses on managing internal e-business system and networks. It provides management insights to those who obtain e-business operations from outsourcing firms.

Part V relates IT investment and returns to financial control, customer relations, and Client expectations. This part also covers IT control, asset protection and security.

Part VI focuses on how high performance managers restructure business processes; introduce new technology and manage talented people with sensitivity and skill. When restructuring first–line and senior managers must manage individual transitions skillfully. This section elaborates how to achieve
high morale and discusses ethical and legal considerations in managing employees. [2]

Efraim Turban, Ephraim Mclean and James Wetherbe (2007)

In their published book ‘Information Technology for Management’ authors focused on major role of information technology is to provide organizations with strategic advantage by facilitating problem solving, increasing productivity and quality. The book is divided into five major parts, composed of 16 regular chapters supplemented by five technological guides.

Part I gives an overview of IT in the organization. The three chapters in the part I introduces the drivers of the use of information technology in the digital economy. It also presents the foundations of information systems and their strategic use. Special attention is given to the role of information systems play in facilitating web based business models and strategic information systems.

The part II introduces the web based technologies and applications, starting with telecommunication network and the role of the internet, intranet and extranet in contributing to communication, collaboration, and information discovery. Electronic commerce is presented in a comprehensive way, followed by mobile and wireless computing in chapter 6.

Part III begins with the basic IT applications in the transactions processing, functional applications, customer relationship management, supply chain management and web-based enterprise systems. Planning for technology and the necessary organizational restructuring is also discussed.

Part IV discusses that the many ways in the information systems can be used to support the day to day operations of a company, with a strong emphasis the use of IT in the managerial decision making. The three chapters in this part address to that in many way the business are using information technology to solve specific problems and to build strategic, innovative systems that enhance quality and productivity. Special attention is given to innovative applications of
knowledge management, data analysis and data management, and decision support and intelligent support systems.

Part V explores several topics related to the implementation, evaluation, construction, and maintenance of information systems. [3]


The first section gives an introduction to ERP, explains the basic concepts, demystifies the common ERP myths, discusses the risks and benefits of ERP and help in justifying the ERP investment and explain why it is imperative that the organization should implement ERP.

The second section ERP and Technology gives an overview of the technology that are related to ERP and are necessary to improve the capacities of the ERP system and that help in transforming discussed include business intelligence (BI), E-Business and E-Commerce, BPR, Data warehousing, Data Mining line analytical processing (OLAP), Product Life Cycle Management (PLCM), Supply Chain Management (SCM) & Customer Relationship Management (CRM).

Section three deals with the ERP implementation issues. It starts right from the beginning selection of the ERP package for the company and discusses all issues that will crop up before, during and after implementation. Some of the topics that are discussed are package selection, implementation lifecycle, implementation methodologies, implementation costs, and implementation team, role of vendor and consultants, contracts with vendors and consultants and so on. It also discusses the factors that determine success and failure of the ERP system.

The fourth section ERP in Action deals with the post implementation scenario. It discusses what will happen after going live, what task should be performed for maintaining the momentum of the ERP implementation, what skill required, what should be the organizational structure of the ERP team that is responsible
for the operation and maintenance phase and how to get the best out of the ERP system.

Section five deals with the major modules in an ERP package and how each module functions. The sixth section is about the ERP market place and the major players in the ERP market.

The seventh section deals with the technological advancement that will change the nature of today ERP packages. This section includes topics like turbo charging the ERP system, enterprise integration application (EIA) ERP and E-Business, ERP, Internet and WWW, ERP and Total Quality Management and future direction and trends.[4]

2.3 Ph D THESIS REVIEWS

**Shirodkar S.L. (1967)** produced his Ph.D. work on the “Co-operative Movement in Kolhapur District.” In this context, he has analyzed the impact of co-operative sugar factories on the agriculture of the region. According to him, co-operative sugar factories have imparted stability to the agriculture income by paying reasonable and guaranteed price for a noticeable increase in the production of sugarcane. Not only these factories provide the reasonable and guaranteed price, but also they provide various facilities to agriculturists. As the Co-operative sugar factories are agents of rural economic development, the factories must be established in the backward area so that the backward area can get a chance of its all around development. [5]

**Kohak M.A. (1982)** in his research study entitled: Socio economic effects of Co-operative sugar Factory – A Case Study of Niphad (Dist-Nashik) Shakari Sakhar Karkhana has studied effects of sugar factory on agriculture, cultivators and on agriculture laborers. He also studied the impact of sugar factory on the development of infrastructure, social services like education, medical facilities, capital formation and employment generation in the area of operation of sugar factory. From his study he concluded that because of the establishment of the sugar factory, the tendency of depending solely on the cash crop like sugarcane has been increasing among the farmers, which may ultimately has adverse effect on other farmers.
Secondly, sugarcane requires proportionately more water compare to the other crops i.e. nearly for a period between 15 and 18 months till its maturity. If the available water is used for other crops of 3 to 4 months duration, more land can be brought under irrigation. This will help in increasing agriculture productivity and it is the need of the time. He also concludes that a co-operative sugar factory accelerates economic development in its area of operation only. [6]

Kharche R. M (1987) has worked on the topic “Co-operative Sugar Factories in Marathwada-A Critical Study” for his Ph.D degree examination in 1987. In his work, he has discussed the licensing policy of sugar industry of the Government of India. Then he analyzed financial structure of co-operative sugar factories. In connection with the efficiency of sugar factories the importance of the supply of sugarcane, sugarcane development activities and other problems relating to the supply of raw material i.e. sugarcane are also discussed in this thesis. Further he has also studied other aspects of sugar factories like the cost of production of sugar, role of management in the development of the sugar factories and the socioeconomic impact of co-operative sugar factories in their areas of operation. Finally he has analyzed the causes of sickness of sugar factories and has made some recommendation to overcome the problems of sickness.

Thus various scholars have studied the various aspects of the sugar industry separately. It should be emphasized here that whenever a particular factory is established in a region, it influences the economy of the region in all its aspects from all the angles. Hence, it would be better to take into consideration the impact of factory as a whole and not by parts. In the present thesis, in addition to these aspects already mentioned an attempt has been made to study the rural economy as a whole as influenced by the sugar factory in its area of operation [7]

V. M. Hilage (1989) in his study on " Performance of sugar cooperatives: A critical Study of two cooperative sugar factories” analyzed the performance of the Warana Cooperative Sugar Factory and Dudhaganga Vedganga cooperative sugar factory. The study revealed that the Cooperative Act 1904 played a significant role till 1947 in sugar sector. But the cooperative sugar sector suffered mostly from financial weaknesses and lack of professionalism. The
author has discussed in depth the operational performance, member oriented performance and development oriented performance. The author is of the view that the performance of sugar factories can be improved by developing sugar cane in scientific manner, providing greater facilities of lift irrigation, paying proper attention to harvesting and transportation schedule of sugar cane and controlling diseases and pests. [8]

K D Jadhav (1991) examined the socioeconomic impact of six sugar cooperative factories in Satara District of Maharashtra during 1982 to 1989. The objectives of the study were to study the growth of sugar industry during the period in Satara district; to examine the total fund raised as share capital; to estimate employment generation and to examine contribution of rural development. The research report revealed that the number of cooperative sugar factories increased in the region; socioeconomic growth has been taking place in Satara district. Sahyadri Sahakari Sakhar Karkhana is leading in socioeconomic development of area of operation and employment generation. [9]

A G Anikhindi (1995) conducted study of computerized cost based information system for decision making in selected organizations from Kolhapur district. Researcher selected four sector viz. private, public, service and cooperative. During his research he concluded private organizations are ahead in using computer based information system and others are lagging behind in this regard. Researcher has suggested model for computer based information system and observed benefits of computer based information system in private organization are

1) Reduction in cost and product life cycle
2) Inventory control
3) Optimum utilization of capacity
4) Decision making is more effective. [10]

Mohd. Kamal Ali Eljack,( 1997) In his Study on "Comparative Study of Manpower Planning and Development in Sugar Factories in India and Sudan" has compared the manpower planning of his own country India with that of Sudan, which includes policy for manpower planning, recruitment, selection and
other functions of human resource management. The study focuses on selected Sugar Factories from Sudan viz. Sennar Sugar Factory and from India viz Shri Dutta Cooperative Sugar Factory, Shirur.

Major findings of the study are - there is no separate Human Resource Department. The Sugar Factory in India under the study follows the manpower pattern suggested by Sugar Commissioner; however, the said pattern is not strictly implemented. The study also focuses on other aspects of profile of the manpower like age, experience, training etc. The study suggests the regular inspection of manpower for its training and awareness, and appropriate safety for the employees working with machineries. The transportation facility provided at Sennar Factory in Sudan is not sufficient and needs to be improved whereas there is need to implement such practice in Shri Dutta Cooperative Sugar Factory. The facilities like canteen, medical treatment needs to be upgraded at both the Sugar Factories under study. Besides above, the author has also suggested areas of improvement related to Human Resource Management. [11]

U M Deshmukh (1999), carried out ‘A Comparative Study of Material Management of Engineering and Sugar Industry in Kolhapur District’ for Ph.D. work. In this study researcher examined material management practices adopted by sugar factories and engineering units under study. He found that engineering units adopted scientific approach whereas sugar industries are lacking behind in this regard. Researcher also observed that engineering units used computer based information systems but sugar units handicapped in this respect. Author also identified need of exclusively developed inventory management software which will be useful for following areas.
1) Material Planning and Program
2) Purchasing
3) Receiving
4) Storing
5) Issuing and
6) Store accounting [12]
**Vandana S Dandekar (2000)** made an economic analysis to find out rate of return to education due to inception of sugar cooperative factories in Sangli District of Maharashtra State during the period of 1987 to 1997. The required primary data was gathered with the help of structured questionnaire. The main objectives were to measure the return to educational expenditure of the employees in sugar cooperatives to measure the social, private and marginal rate of return. The published reports of the sugar cooperatives and government records were used as secondary data. The study revealed that 99 percent employees had invested in Life Insurance Corporation and purchased Gold and primary education cost was Rs 5811, High school Rs.8644 and ITI Rs 13420. [13]

**Yashwant S. Patil (2001)** carried out research study on Computerized Management Information Systems for Sugar Cooperatives in Maharashtra State. The research reveals that, the computerization of three sugar factories in particular and of the 7 sugar factories in general. It is observed that the computerization in sugar cooperatives is in infancy stage. The study also reveals hurdles before the cooperative sugar factories for computerization. The researcher has identified many hurdles and main hurdles include

i) Lack of support from the top level management.

ii) Lack of awareness of computerization and its benefits for effective and efficient Management.

iii) Non availability of computer qualified and experienced manpower locally.

iv) No separate provision for funds on the lines of other departmental budgets.

The researcher has suggested a need for systematic approach in computerization and its integration into various information systems, with the involvement of top level personnel of the sugar factories and departmental heads. Besides, the researcher has also made valuable suggestions for effective and efficient usage of computerization which includes formation of IT Committee, networking of sugar cooperatives and other regulatory agencies for seamless information flow. The suggested ERP model also takes care of integration of various systems and sub systems of the sugar factories. [14]
A.M. Gurav (2003) produced his research work on “A Study of Cost and Productivity of cooperative sugar factories in Kolhapur District”. In this context, he has examined financial position of sugar factories under study and evaluated cost of production excluding cane price and including cane price. Researcher analyzed productivity performance and identified different areas for cost reduction. Author emphasized necessity of atomization and computerization for reduction of manpower and inventory cost. [15]

2.4 REVIEWS OF RESEARCH ARTICLES AND CONFERENCE PROCEEDINGS

Krishnamaraju A.V (1989) had given basic idea on how to utilize computer for better advantage to the Cane Management in his article. Author discussed various activities of cane management function and identified requirement of Computerized Cane Management System. Author emphasized Scientific Management of cane crop and need of maintaining metrological data, fertilization data, irrigation data and yield data with the help of computers. At end part of the paper author discussed benefits of computerized cane management and necessity of trained Computer Professional for design and developing Computer based applications. [16]

Deshpande S.M and Hapase D.G (1992) presented case study of Dnyaneshwar SSK Ltd. on implementation of computerized harvesting program in DSTA conference.

In this study, authors made an attempt to show the feasibility of computer in developing efficient harvesting program in order to improve sugar recovery from available sugarcane. Authors collected and analyzed data regarding to recovery before and after the computerization of harvesting program.

Further, authors expressed economic aspects of computer based harvesting program. Also author considered benefits of Computer based harvesting schedule are as follows:-

1) Definite rise in recovery was observed.
2) Farmer knows it clearly when his sugarcane will be harvested.
3) All possible harvesting information is really available which improves working efficiency.
4) Manager requirement for the data analysis is very less as compared to the manual process.[17]

**Jaiswal M.P and Singh N.P (1993)** presented research paper, titled ‘Information Technology Network in Co-operative Management’ in second state level sugar conference. This paper broadly classified areas of computerization in sugar co-operatives in two, one is factory automation and the second one is transaction processing and information systems with subsystems in each area. Study made a comparison of IT applications in three sugar co-operative units Viz. Ajinkyatara SSK Satara, Vasantdada SSSK Sangli and Yashwantrao SSK Theur.

Further, authors discussed the need of system integration, design, development and implementation of information system required for various levels of management in co-operative sugar units and apex organizations.

This paper provides the basic framework for computerization of sugar cooperative in Maharashtra and a need for information sharing between the different co-operative sugar units and apex organization. [18]

**Acharya G.N and Balwe T.K (1993)** identified different areas of computerization in the paper presented in the second state level sugar conference at Malegaon Tal Baramati Dist Pune. In the paper authors suggested phased program for computerization and infrastructure for computerization.

Further author discussed about the various software modules developed by VSI and observations and result of maturity wise harvesting module implemented in Dnyaneshwar Sahakari Sakhar Karkhana Ltd. Dnyaneshwarnagar Dist Ahmednagar.

In concluding part of the paper, author emphasized necessity of boosting up of the pace of work in the modernization of sugar factories and reap the full benefits of rapidly expanding technology of computer applications and arrangement of periodic training programs including one hand experience with computer.[19]

**Love D.J (1997)** emphasized advances in technology and computer based automation for the sugar industry in the paper ‘Sugar Factory Automation’
presented in XII sugar industry congress (1995) in Colombia and a paper is published in Journal Indian Sugar in 1997. Author discussed basic requirement of automatic control system and computer based automation system for increasing throughputs, improve efficiency, reduction of losses and cost. Further, author identified areas of automation and design of computer aided manufacturing system. The different areas for automation suggested by author are juice weighing, boiler Automation, PH Control systems, Pan Atomization, Centrifugal Atomization and Sugar Weighing System. [20]

**Shri P.N. Gavade and Dr. J.F. Patil (1998)** highlighted problems and prospects and situation of cooperative movement in sugar industry of the post independence era and performance of sugar industry in terms of crushing and production.

Further, author also emphasized role of sugar co-operatives in rural development of Maharashatra. In this, sugar factories are not only income generating organizations but these organizations work as an agent of socio-economical transformation of rural Maharashatra

The authors also focused on the problems faced by co-operative sugar factories. Some of the problems are -

1) Lack of good management
2) Lack of technical efficiency
3) Overstaffing
4) High cost of production
5) Challenge of competition & globalization
6) Challenge of withdrawal of government support & assistance
7) Challenge of emerging opportunities

At the end part of this article, authors emphasized prospects of co-op sugar industry in India and gave guidelines for bright future of industry. For the survival in the 21st century, authors gave advice of computerization. The sugar co-operatives should introduce computersation and adopt the technological changes to modernize their working. Computer application should be used to cane cultivation, production, harvesting and payment of bills. [21]
Saxena A.K, Kumar Gyanendra and Singh S.L (1998) presented paper on ‘Process Computers for Sugar Industry’ in S.T.A.I annual conference. In this paper, author highlighted a need of Micro computer based distributed digital control system in spite of conventional instrumentation. Authors further explained features of computer based control systems and criteria for selection of process for implementation of computer controlled system. The different areas identified by authors to implement computer controlled process are Boiler house, evaporation station, Pan Stored pH control etc.

In Concluding part of the paper, authors summarized resulting advantages of computer based distributed digital control systems implemented in private sugar factories in Tamilnadu. [22]

Munnyold B E (1999) focused on the implementation of information technology in his research article “Challenges of IT implementation for supporting collaboration in distributed organizations” published in European Journal of Information system. Author designed and developed six case studies of IT implementation projects, focusing on the challenges in the implementation process as seen from the perspective of the implementation team. The study is an exploratory nature; the study has identified a large number of issues that have influenced the different stages in the implementation process. The implementation context studied is found to imply several additional challenges for the implementation team, compared to ‘traditional’ intra-organizational IT implementation. This is a result of greater autonomy among the participating units, heterogeneous technological platforms and logistical barriers in the implementation activities. Resistance from the organizational units, technological incompatibility and lack of incentives for adopting new work practices, are identified as major barriers in the implementation. [23]

Anupam Katkam(2002) examined status of warana wired village project in his published article ‘The Warana Experiment’ in Frontline. The primary data is used to examine usage of Warana Wired Village Project. The aim of project is enable sugarcane farmers to interface with a cooperative sugar factory through computers. Under the ‘Warana Wired Village Project’, the villages in this sugarcane growing region have computers that are linked to a central network
that provides farmers access to essential pieces of information such as the ideal time for planting and harvesting sugarcane, the current market rates for their produce and payments made by factory. The project is not successful because of technical infrastructure i.e slow speed communications lines, application software and long periods of power cuts. Author also found that there is very less people’s participation in the use of project. [24]

T.K. Balwe (2004) examined the designed and developed ERP software package known as VSI Sugar ERP for Indian sugar Industry. Author discussed in detail features of package, advantages, required infrastructure, implementation process and experiences of sugar factories who have implemented VSI Sugar ERP. It is a software package aimed to prove an integrated, low cost, software solution for sugar and allied industry with full and assured maintenance backup. The expected benefit of the package as expressed by the author are the availability of relevant in formation, low cost of production, efficient and smooth working of whole setup and profitable business. The Salient features of VSI sugar ERP are user friendly, Easy and flexible for implementation and customization, ensured security rights wherever and whenever required and adoptable to need based modifications for additional development.

Further, author also emphasized the required infrastructure like hardware, system software, networking, improvement in the procedures and trained manpower.

This package is already implemented in 8 sugar cooperative units in Maharashtra & and the performance of various models in package was reported to be quite satisfactory.

The author also highlighted the necessary of this package to the sugar industries so as to bring a transformation in the operations of the sugar cooperative industries. [25]

S.S.Sirohi (2005) studied the status of co-operative sugar industry in India-past, present and future. This research article described the status of cooperative sugar industry in India during 1936 to 1950, 1951-1985 and 1986-2005. In these periods’ co-operative sugar industries under went major changes. The author has
given various recommendations for improving health of sugar industry. Further author focused need of professional management and computerized systems for effective management. [26]

Vinay Kumar (2006), Managing Director of national Federation of Co-operative Sugar Factories New Delhi, analyzed Sugar Technology-Prospects and challenges with reference to the technical area of the sugar industry and the efficiency norms applicable to the industry and concluded with a remark that the productivity can be improved by developing sugar complexes with the help of professional management and computer based automation. [27]

Miss Banishree Das, Dr Nirod Kumar Palai and Dr Kumar Das(2006) analyzed the problems and prospects of cooperative sector in India under free markets in the paper presented at XIVth International Economic History Congress, held at Helsinki. The paper examined the causes of slow progress and highlights the emerging role and challenges of the cooperative sector. In comparison to the step-motherly treatment of the past, cooperatives are now considered an important plank of development. The government is committed to cooperative development. The cooperatives have inherent advantages in tackling the problems of poverty alleviation, food security and employment generation. Cooperatives are also considered to have immense potential to deliver goods and services in areas where both the state and the private sector have failed.

The paper focuses on several pitfalls and shortcomings like: poor infrastructure, lack of quality management, over-dependence on government, dormant membership, non-conduct of elections, lack of strong human resources policy, absence of professionalism, etc. It suggests evolving strong communication and public relations strategies which can promote the concept of cooperation among the masses. It should also push forward by developing effective strategies to overcome existing weaknesses and for continuing growth of the sector. The paper makes an assessment of the future prospects of the cooperative sector of India. [28]

Balwant Kumar, S S Panday and D N Kamat(2007) examined the fifteen sugarcane clones of different maturity groups, which were grown under eight
different environments, such as autumn and spring crops of two consecutive years during 1999-2000 to 20002-2003 at Pusa farm Bihar. It was found that the BO128 clone suitable for autumn crop whereas, BO110 and BO109 were suitable for spring crop. [29]

2.5 EVALUATION OF REVIEWED LITERATURE
The reviewed literature revealed the following broad conclusions.

Going through the available literature that the researcher could lay his hands on so far there appears to be a critical gap so far as the process of computerization and introduction and implementation of ERP project as whole in the cooperative sugar factories. Most of the literature reviewed revealed that the earlier studies were mainly related to various aspects and dimensions of sugar industry other than computerization and ERP system in the cooperative sugar factories. The books reviewed provided a theoretical standard towards application of information technology and ERP projects and so is the case with Ph D thesis and most of the research articles reviewed.

No doubt the process of computerization has been introduced since 1990 in the area of study undertaken by the researcher but the whole approach was on piece meal basis. i.e. some of the activities and departments in cooperative sugar factories were computerized. Some efforts were made by VSI and Warana SSK but they didn’t get success in this regard. No systematic efforts have so far been made to introduce ERP system to integrate all the activities and various departments under the belt. i.e. the whole supply chain management of sugar industry. Neither effort were made for the systematic studies were conducted to probe into the problems and prospects of introduction of ERP system and information technology in cooperative sugar factories to cover the whole process of supply chain management of such factories. How all the activities, right from procurement of sugarcane, helping sugarcane growers with latest technologies, to the distribution of sugar and various functional areas etc can be integrated through ERP Systems? What could be the problems and difficulties these factories will have to encounter in introducing the system? What could be possible solutions to overcome them? These are certain issues which warrant attention of the researcher to restore the failing health of cooperative sugar factories to some extent. Keeping all this in mind the researcher has decided to
look and probe into this critical gap that has come to his notice lie and to conduct the study to throw some light on the problems and prospects of introduction of computerization and ERP in cooperative sugar industry.
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18) Jaiswal M.P and Singh N.P(1993), ‘Second State Level Sugar Conference, Malegaon July 4-5,1993,’ conference proceeding page No.4.1 to 4.15


28) Miss Banishree Das,Dr Nirod Kumar Palai and Dr Kumar Das, “Problems And Prospects Of The Cooperative Movement In India Under The Globalization Regime”, XIV International Economic History Congress, Helsinki 2006, Session 72