Report on NGITS'99:
The Fourth International Workshop on Next Generation Information Technologies and Systems

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Introduction:
NGITS is a series of biannual international workshops held in Israel since 1993. The fourth workshop was held in Zikhron-Yaakov on July 5-7, 1999. NGITS'99 has been supported by the Technion, the IBM Research Laboratory in Haifa, and the Tandem Labs Israel, a Compaq company. The general chairs were **Opher Etzion** and **Moshe Tennenholtz**; the program chairs were **Ron Pinter** and **Shalom Tsur.** NGITS workshops are aimed to be a forum for discussion of issues related to the technologies that have a potential to drive the next generation information systems. This report surveys the different sessions of the workshops, and discusses the evolution of the NGITS series over the years.

NGITS'99 in a nutshell:
NGITS'99 was attended by 60 delegates from three continents. 17 full papers and 5 short papers have been accepted for presentation at the workshop. There were two invited talks: the first one by **Jefferey D. Ullman**, from Stanford University, who talked about **Some advances in data-mining techniques.** The second invited speaker was **C. Mohan**, from the IBM research center at Almaden, who talked about **Workflow management in the Internet age.**
There has been one panel, moderated by **Ron Pinter** entitled : "**XML - Back to the future**?" and paper sessions that contained both paper presentations and discussions. The workshop atmosphere was realized by the allocation of a quarter of the time in each session to a discussion lead by the session chair.

The paper sessions in NGITS'99 were: Web Exploration, Database Technology (two sessions), Storage, Meta Information, Ontologies and Software Engineering, Agent and workflow Management technology and Data warehousing and mining.

The Web Exploration Session:
This session was chaired by **Arie Segev.** It consisted of two papers that discussed the query techniques on the WWW, and one paper that dealt with E-mail filtering techniques. Traditionally in NGITS, the first session is chosen to reflect the topic which best matches the next generation . It is no surprising that this was the second time that Web issues were chosen to open the workshop. The paper [1] by Bar-Yossef et al described the QUEST system that queries semantically tagged documents. It uses homemade tagging system that preceded XML. The paper [2] by Konopnicki and Shmueli deals with WWW queries. It presents a simple graph based query language. Both the query and the target are graphs. The paper [3] by Shoval et al. deals with the filtering of E-mail messages combining content-based and user modeling filters, based on empirical results.

The Database Technology Sessions:
There were two database technology sessions.
The first one chaired by **Asuman Dogac**, and the second one chaired by **Avi Silbershatz.**
NGITS is not a database conference, however it always contained a substantial number of submissions from the database area.

The paper [4] by Henrich and Jamin deals with queries containing regular path expressions. The paper [5] by Baumann presents an array algebra for spatio-temporal databases. The paper [6] by Sapir and Gudes discusses dynamic relationships and their propagation in object oriented databases.
The paper [7] by Wolfson et al describes a system (that was demonstrated at the workshop) of tracking moving objects using spatio-temporal database. The paper [8] by Liu describes a deductive object oriented system. It supports object-oriented features that are not supported by other deductive databases. The paper [9] by Motro describes the Multiplex system which integrates information from multiple databases. The paper [10] by Golani and Etzion deals with temporal ECA rules. It discusses different versions of rules that may be applicable simultaneously, and discusses valid time, transaction time, and bi-temporal rule models.

The Storage, meta information, ontologies and software engineering session.
This session, chaired by **Ouri Wolfson**, dealt with a variety of topics. The paper [11] by Birk and Mokryn describes storage technology based on hybrid file-block caching. The paper [12] by Christophides et al discusses an ontology-driven integration of scientific repositories. The paper [13] by Schonhoff and Strassler deals with the integration of engineering environment based on global version management for a federated system, with an application for a turbine design environment. The paper [14] by Peleg and Dori discusses an object-process language for system specification using graphic notation, and its translation to formal specification. The paper [15] by Edelstein et al discusses a methodology to achieve reuse and knowledge sharing within an enterprise by applying information retrieval techniques to object oriented resources.

The Agent and workflow technology session.
This session, chaired by **Ami Motro,** consisted of three papers. The paper [16] by Koksal et al discusses the enactment of component based workflow system that supports dynamic modifications. The paper [17] by Cieckli provides temporal semantics to the modeling of workflow activity using a simplified form of event calculus. The paper [18] by Gidron et al describes dynamic configuration of mobile components.

The Data Warehousing and mining session.
This last but not least session of papers, chaired by **Mori Rimon**, dealt with data warehousing, data mining and text mining issues. The paper [19] by Wolff and Cremers, described the MyVIEW project, which provides a data warehousing approach to personalized digital libraries. The paper [20] by Nestorov and Tsur deals with tight-coupling between data mining and relational database technology. The last paper [21] by Carmel and Maarek provided the local Israeli flavor, by discussing text mining problems that are specific to the Hebrew language and described morphological disambiguation techniques for Hebrew.

The XML Panel.
The panel, entitled: **XML - Back to the future?** was moderated by **Ron Pinter.**
The panelists were: **Asuman Dogac, Yoelle Maarek** and **Shuki Sagiv**. The panel questions have been:

- What are the chances for XML to indeed become the standard "information container" format?
- What can the database/knowledge management/ information retrieval/ programming languages communities do to help XML succeed?
- How - in turn - will XML push these technologies?

- What are the major potential directions for future evolution?
- What are the major inhibitors?
- How about semantics (RDF and beyond)?
- Is it a real paradigm shift (away from RDBMS, but still "well structured")?

There was a general agreement among the panelists about the importance of standards, and the success of XML to become a standard. It was also agreed that XML is only in early stages, and poses challenges to various communities. The panelists were not in the opinion that XML represents a paradigm shift. There were comments from the audience about semantic problems in current XML definitions.

The evolution of the NGITS series

The first NGITS workshop [22] took place in 1993. The workshop's scope and goals have not changed over the years, and the call for papers were aimed at the same communities. It is interesting to point out some observations about the evolution of topics discussed in NGITS. Table 1 presents information about the distribution of accepted papers by topic. In the NGITS series, the first session of the workshop is dedicated to the issue that best represents the timely notion of next generation, as noted in the submitted papers. These topics are highlighted in Table 1. In NGITS'93, the chosen topic was **object oriented technology**, in contrast there were no object oriented related papers present in NGITS'95. It may indicate that object oriented technology has moved from the next generation into the main stream. **Database technology** has been always the topic with relatively high number of submissions, it was chosen in NGITS'95 [23] to be a first session entitled: "next generation databases". **Web Technology** papers were first presented in NGITS'95 under the title "Information Gathering". In NGITS'97 [24] and NGITS'99 it was chosen as a first session. Other areas such as: cooperation, software engineering and information retrieval were present in most of the workshops. Multimedia issues were present in NGITS'93 and NGITS'95 and were not represented in the last two workshops. New topics that emerged since 1997 are: **knowledge discovery** and **workflow technology.**

Topic	93	95	97	99
access methods	0	0	2	0
applications	1	1	0	2
artificial intelligence	3	1	2	0
cooperation	5	5	0	2
databases	4	**7**	9	7
information retrieval	1	0	2	1
knowledge discovery	0	0	2	1
multimedia	4	3	0	0
object oriented technology	**3**	0	2	2
software engineering	1	1	2	0
storage	0	0	0	1
user interfaces	0	2	0	0
Web Technology	0	3	**3**	**4**
Workflow technology	0	0	2	2

Table 1: Distribution of accepted papers over the years.

References :

References [1] - [21] are of the papers that have been presented in NGITS'99. The Proceedings were published by Springer-Verlag as LNCS 1649 , Editors: Ron Pinter and Shalom Tsur. The page number refers to the proceedings.

[1]. Ziv Bar-Yossef, Yaron Kanza, Yakov A. Kogan, Werner Nutt, Yehoshua Sagiv: Querying Semantically Tagged Documents on the World-Wide Web. 2-19

[2]. David Konopnicki, Oded Shmueli: WWW Exploration Queries. 20-39

[3]. Peretz Shoval, Bracha Shapira, Uri Hanani: Strategies for Filtering E-mail Messages Combining Content-Based and Sociological Filtering with User-Stereotypes. 40-49

[4]. Andreas Henrich, Stefan Jamin: On the Optimization of Queries Containing Regular Path Expressions. 58-75

[5]. Peter Baumann: A Database Array Algebra for Spatio-Temporal Data and Beyond. 76-93

[6]. Amir Sapir, Ehud Gudes: Dynamic Relationships and Their Propagation and Concurrency Semantics in Object-Oriented Databases. 94-111

[7]. Ouri Wolfson, A. Prasad Sistla, Bo Xu, Jutai Zhou, Sam Chamberlain, Yelena Yesha, Naphtali Rishe: Tracking Moving Objects and Using Database Technology in DOMINO. 112-119

[8]. Mengchi Liu: OLOG: A Deductive Object Database Language. 120-137

[9]. Amihai Motro: Multiplex: A Formal Model for Multidatabases and Its Implementation. 138

[10]. Mati Golani, Opher Etzion: Temporal Active Rules. 159-172

[11]. Yitzhak Birk, Mark Mokryn: Cost-Effective Jukebox Storage via Hybrid File-Block Caching. 173-189

[12]. Vassilis Christophides, Catherine Houstis, Spyros Lalis, Hariklia Tsalapata:. Onthology-Driven Integration of Scientific Repositories. 190-202

[13]. Martin Schönhoff, Markus Strässler: Global Version Management for a Federated Turbine Design Environment. 203-220

[14]. Mor Peleg, Dov Dori: From Object-Process Diagrams to a Natural Object-Process Language. 221-228

[15]. Orit Edelstein, Avi Yaeli, Gabi Zodik: e-Colabra: An Enterprise Collaboration & Reuse Environment. 229-236

[16]. Pinar Koksal, Ibrahim Cingil, Asuman Dogac: A Component-Based Workflow System with Dynamic Modifications. 238-255

[17]. Nihan Kesim Cicekli: A Temporal Reasoning Approach to Model Workflow Activities. 256-266

[18]. Yoad Gidron, Israel Ben-Shaul, Yariv Aridor: Dynamic Configuration Enforcement of Access Control for Mobile Components. 267-276

[19]. Jens E. Wolff, Armin B. Cremers: The MyVIEW Project: A Data Warehousing Approach to Personalized Digital Libraries. 277-294

[20]. Svetlozar Nestorov, Shalom Tsur: Integrating Data Mining with Relational DBMS: A Tightly-Coupled Approach. 295-311

[21]. David Carmel, Yoëlle S. Maarek: Morphological Disambiguation for Hebrew Search Systems. 312-326

[22]. Opher Etzion, Arie Segev (Editors): Proceedings NGITS'93, June 28-30, 1993.

[23]. Amihai Motro, Moshe Tennenholtz (Editors): Proceedings NGITS'95, June 27-29, 1995.

[24]. Peretz Shoval, Avi Silbershatz (Editors): Proceedings NGITS'97, June 30 - July 3, 1997.