CHAPTER 6 - SYSTEM EVALUATION

6.1 OVERVIEW

An evaluation process is essential to ensure that the software project, processes and the end-product have achieved the requirements. This chapter discusses the user evaluation and the accuracy of the forecasting results generated by MPID.

6.2 USER EVALUATION

The user evaluation was carried out to gather feedback on the user satisfaction towards MPID. The evaluation could be based on several techniques such as users' feedback and prototyping performance analysis (Crozat, Hu and Triagano, 1999). MacNealy (1992) in her review on research lamented that user survey is by far the most frequently used method employed by researchers in system evaluation. This method can generate large amount of quantifiable data in an inexpensive manner. Thus, this method was used to evaluate MPID.

Before conducting the user survey, a questionnaire (Appendix E) was prepared. The construction of the questionnaire was based on the Software Usability Measurement Inventory (SUMI) (Human Factor Research Group, 2000) and Generic Use Interface Questionnaire (QUIS) (Chin, Diehl and Norman, 1988). The questionnaire has three sections and consists of twenty-five questions altogether. Section 1 (four questions) requires the users to fill in their respective information. Section 2 (twenty questions) is the system evaluation and section 3 (one question) is an open-ended question, which requires the users to give their feedback or comments (if any).

Before conducting the survey proper, a pilot test was carried out on ten participants comprising business executives from several telecommunication companies. The purpose of the pilot test was to obtain feedback on the questions and the design of the questionnaire. The pilot test revealed mistakes that had been overlooked, and they were duly corrected. The actual evaluation survey was then carried out.

Altogether, forty-five sets of questionnaire forms were collected. The respondents consist of twenty-nine males and sixteen females. All respondents have computer knowledge as they use computers at work. The respondents included business executives and managers from several telecommunication companies in Malaysia. Table 6.1 shows the evaluation criteria, which include ease of use, usefulness, user satisfaction, display of information and design.

Table 6.1: User Evaluation Criteria

Evaluation Criteria	Questions
Ease of Use	1. Easy to use.
	2. Confident in using **MPID**.
	3. Instructions given are easy to understand.
Usefulness	4. Helps in forecasting the growth of mobile phone usage.
	5. Helps in making business decisions in the telecommunication industry.
	6. **MPID** has all the functions and capabilities that it should have.
User Satisfaction	7. Help messages on the screen are useful.
	8. Error messages are clear on how to fix problems quickly and easily.
	9. Task can be performed in a straightforward manner.
	10. Exploring features by trial and error was easy.
	11. **MPID** responds quickly to inputs.
Display of Information	12. Organisation of information on the screen is logical.
	13. The reports are very clear.
	14. Amount of information displayed on the screen is adequate.
	15. Screen sequence is logical.
Design	16. The wordings are clear and easy to read.
	17. The colour combination is suitable.
	18. The graphs are clear and easy to understand.
	19. Navigation from one screen to another is easy.
	20. Can exit from **MPID** at anytime.

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Table 6.2 shows the results of analysis of the user evaluation. Each value in the table represent the total results of users' evaluation, whereas, the numbers in the brackets are the percentages. The results show that users evaluated MPID favourably. The overall percentages for "Totally Agee" and "Agree" are above 90 per cent for all the criteria except for usefulness (78%). This could due to the fact that the respondents were not able to determine the usefulness of MPID as they were asked to evaluate it with little prior hands-on experience.

Table 6.2: Results of User Evaluation

Opinion	User Evaluation Criterion									
	Ease Of Use (%)		Usefulness (%)		User Satisfaction (%)		Display of Information (%)		Design (%)	
Totally Disagree	0 (0)		0 (0)		0 (0)		0 (0)		0 (0)	
		0 (0)		1 (1)		0 (0)		0 (0)		0 (0)
Disagree	0 (0)		1 (1)		0 (0)		0 (0)		0 (0)	
Not Sure	6 (4)	6 (4)	29 (21)	29 (21)	13 (6)	13 (6)	0 (0)	0 (0)	0 (0)	0 (0)
Agree	44 (33)		80 (59)		101 (45)		71 (39)		51 (23)	
		129 (96)		105 (78)		212 (94)		180 (100)		225 (100)
Totally Agree	85 (63)		25 (19)		111 (49)		109 (61)		174 (77)	

Figure 6.1 shows the results of analysis of the user evaluation in a bar graph distributed either as **Not Favourable** ("Totally Disagree" and "Disagree") or **Not Sure** or **Favourable** ("Agree" and "Totally Agree").
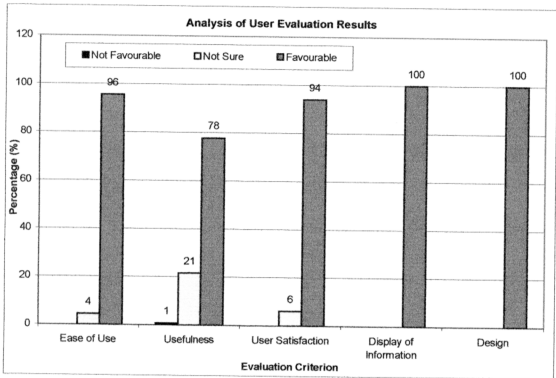
Figure 6.1: Results of User Evaluation

6.3 ACCURACY OF FORECASTED RESULTS

Accuracy is defined as the average degree of correspondence between individual pairs of forecasting and observations (Battaglia, 1996). The accuracy of the results forecasted by MPID is measured based on a comparison of the actual growth of mobile phone usage and the forecasted results.

6.3.1 MPID Forecasted Results

This section discusses the forecasted results of the growth of mobile phone usage (increase in the number of subscribers) and the growth rate of mobile phone usage (percentage of growth). Table 6.3 shows the forecasted results from the year 1990 to 2010.

From the table, the figures in the shaded cells in each row indicate the highest growth of mobile phone usage for the particular year based on one, and on two features, respectively. It can be observed that different features induce the different growth for each year. Table 6-1 shows MPID's forecasted growth rates of mobile phone usage. For example, in 1991, the growth rate of mobile phone is 210 per cent based on the increase from ten subscribers in 1990 to thirty-one subscribers in 1991 based on one mobile phone feature (wireless solution).

Table 6.3: MPID Forecasted Growth of Mobile Phone Usage ('000) (1990-2010)

Year	One Mobile Phone Feature						Two Mobile Phone Features														
	PHY	DUR	SEC	ENT	ACC	WIR	PHY DUR	PHY SEC	PHY ENT	PHY ACC	PHY WIR	DUR SEC	DUR ENT	DUR ACC	DUR WIR	SEC ENT	SEC ACC	SEC WIR	ENT ACC	ENT WIR	ACC WIR
1990	21	0	0	0	0	10	40	42	42	41	43	67	42	73	42	56	62	43	70	43	42
1991	40	0	0	0	0	31	55	55	57	54	58	62	60	62	56	60	62	56	60	57	55
1992	68	0	0	16	0	61	77	78	79	77	81	68	73	65	77	74	66	77	71	79	76
1993	106	85	83	84	89	103	110	111	112	110	114	91	99	86	109	100	88	110	97	111	109
1994	161	198	190	171	211	161	160	161	161	159	162	137	145	131	143	147	134	158	143	160	158
1995	239	331	318	281	351	242	232	232	232	232	233	213	219	209	230	220	211	231	217	231	230
1996	349	489	473	422	513	356	338	337	336	338	336	329	331	328	337	331	329	336	330	336	337
1997	506	676	659	602	700	516	491	490	488	492	486	498	494	502	491	493	500	490	495	488	492
1998	729	898	883	831	916	741	712	709	709	713	705	737	727	745	714	725	713	713	713	710	715
1999	1044	1160	1153	1124	1166	1055	1031	1030	1028	1032	1023	1066	1053	1075	1034	1051	1071	1033	1057	1029	1035
2000	1492	1470	1478	1497	1455	1495	1490	1489	1488	1490	1485	1511	1504	1515	1491	1503	1513	1491	1506	1489	1492
2001	2127	1837	1870	1972	1789	2112	2147	2148	2151	2145	2157	2105	2121	2093	2144	2124	2098	2145	2116	2149	2142
2002	3029	2271	2342	2578	2175	2976	3087	3105	3105	3082	3132	2889	2955	2843	3071	2968	2864	3076	2937	3094	3064
2003	4308	2786	2910	3351	2622	4187	4431	4441	4476	4419	4546	3913	4076	3808	4108	4108	3857	4398	4033	4443	4370
2004	6124	3395	3594	4336	3137	5885	6349	6368	6441	6324	6594	5244	5573	5038	6246	5638	5134	6272	5489	6366	6214
2005	8699	4115	4418	5693	3733	8263	9084	9119	9256	9039	9561	6960	7563	6595	8875	7682	6766	8922	7411	9102	8815
2006	12354	4969	5410	7195	4423	11596	12980	13041	13284	12903	13854	9160	10196	8557	12584	10399	8839	12666	9939	12987	12460
2007	17540	5978	6604	9237	5219	16266	18630	18527	19043	18400	19970	11970	13066	11016	17811	13998	11462	17949	13250	18498	17640
2008	24898	7174	8043	11842	6139	22810	26420	26586	27270	26215	29037	15542	18224	14084	25172	18748	14766	25395	17576	26306	24897
2009	35338	8589	9776	15162	7203	31981	37645	37909	39014	37324	42000	20068	24194	17897	35529	24999	18913	35883	23210	37355	35096
2010	50152	10284	11863	19396	8433	44831	53603	54014	55768	53107	60717	25781	31994	22621	50093	33203	24100	50643	30530	52976	49425

Keys:

PHY: physical attributes   DUR: durability   SEC: security   ENT: entertainment   ACC: accessibility   WIR: wireless solution

Table 6.4 MPID Forecasted Growth Rates of Mobile Phone Usage (1990-2010)

Year	One Mobile Phone Feature (%)						Two Mobile Phone Features (%)														
	PHY	DUR	SEC	ENT	ACC	WIR	PHY DUR	PHY SEC	PHY ENT	PHY ACC	PHY WIR	DUR SEC	DUR ENT	DUR ACC	DUR WIR	SEC ENT	SEC ACC	SEC WIR	ENT ACC	ENT WIR	ACC WIR
1991	90.5	0.0	0.0	0.0	0.0	210.0	37.5	34.1	35.7	35.0	34.9	-7.5	3.4	-15.1	33.3	7.1	-11.4	30.2	0.0	32.6	31.0
1992	70.0	0.0	0.0	0.0	0.0	96.8	40.0	41.8	38.6	42.6	39.7	9.7	21.7	4.8	37.5	23.3	6.5	37.5	18.3	38.6	38.2
1993	55.9	0.0	0.0	425.0	0.0	68.9	42.9	42.3	41.8	42.9	42.1	33.8	35.6	32.3	41.6	35.1	33.3	43.6	36.6	40.5	43.4
1994	51.9	132.9	128.9	103.6	137.1	56.3	45.5	44.1	43.8	44.5	43.8	50.5	46.5	52.3	45.0	47.0	52.3	43.6	47.4	44.1	45.0
1995	48.4	67.2	67.4	64.3	66.4	50.3	45.0	45.0	44.1	45.9	43.8	55.5	51.0	59.5	45.6	49.7	57.5	46.2	51.7	44.4	45.6
1996	46.0	47.7	48.7	50.2	46.2	47.1	45.7	45.3	44.8	45.7	44.2	54.5	51.1	56.9	46.5	50.5	55.9	45.5	52.1	45.5	46.5
1997	45.0	38.2	39.3	42.7	36.5	44.9	45.3	45.4	45.2	45.6	45.1	51.4	49.2	53.0	45.7	48.9	52.0	45.5	50.0	45.2	46.0
1998	44.1	32.8	34.0	38.0	30.9	43.6	45.0	45.1	45.3	44.9	45.1	48.0	47.2	48.4	45.4	47.1	48.2	45.5	47.5	45.5	45.3
1999	43.2	29.2	30.6	35.3	27.3	42.4	44.8	44.9	45.0	44.7	45.1	44.6	44.8	44.3	44.8	45.0	44.5	44.9	44.8	44.9	44.8
2000	42.9	26.7	28.2	33.2	24.8	41.7	44.5	44.6	44.7	44.4	45.2	41.7	42.8	40.9	44.2	43.0	41.3	44.3	42.5	44.7	44.2
2001	42.6	24.5	26.5	31.7	23.0	41.3	44.1	44.3	44.4	44.0	45.3	39.3	41.0	38.2	43.8	41.3	38.7	43.9	40.5	44.2	43.6
2002	42.4	23.6	25.2	30.0	21.6	40.9	43.8	43.9	44.4	43.7	45.2	37.2	39.3	35.8	43.2	39.7	36.5	43.4	38.8	44.0	43.0
2003	42.2	22.7	24.3	30.0	20.6	40.7	43.5	43.7	44.2	43.4	45.1	35.4	37.9	33.9	42.8	38.4	34.7	43.0	37.3	43.6	42.6
2004	42.2	21.9	23.5	29.4	19.6	40.6	43.3	43.4	43.9	43.1	45.1	34.0	36.7	32.3	42.4	37.2	33.1	42.6	36.1	43.3	42.2
2005	42.0	21.2	22.9	29.0	19.0	40.4	43.1	43.2	43.7	42.9	45.0	32.7	35.7	30.9	42.1	36.3	31.8	42.3	35.0	42.7	41.9
2006	42.0	20.8	22.5	28.6	18.5	40.3	42.7	43.0	43.5	42.7	44.9	31.6	34.8	29.7	41.8	35.4	30.6	42.0	34.1	42.7	41.6
2007	42.0	20.3	22.1	28.4	18.0	40.3	42.7	42.9	43.4	42.6	44.8	30.7	34.0	28.7	41.5	34.6	29.7	41.7	33.3	42.4	41.3
2008	41.9	20.0	21.8	28.2	17.6	40.2	42.6	42.7	43.2	42.5	44.7	29.8	33.4	27.9	41.3	33.9	28.8	41.5	32.6	42.2	41.1
2009	41.9	19.7	21.5	28.0	17.3	40.2	42.5	42.6	43.1	42.4	44.6	29.1	32.8	27.1	41.1	33.3	28.1	41.3	32.1	42.0	41.0
2010	41.9	19.5	21.3	27.9	17.1	40.2	42.4	42.5	42.9	42.3	44.5	28.5	32.2	26.4	41.0	32.8	27.4	41.1	31.5	41.8	40.8

Keys:
PHY: physical attributes   DUR: durability   SEC: security   ENT: entertainment   ACC: accessibility   WIR: wireless solution

6.3.2   Accuracy of the Forecasting Model

To study the accuracy of the forecasting model, the actual data collected from the earlier survey were compared with the forecasted results for the years 1990 to 2001. Figures 6.2-6.3 show the comparison of the actual growth of mobile phone usage and the forecasted results based on one, and on two mobile phone features, respectively.
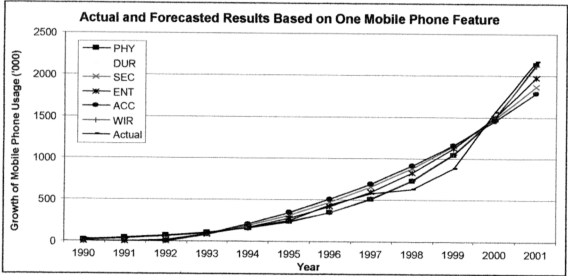

Figure 6.2: Comparison of Actual and Forecasted Results Based on One Mobile Phone Feature
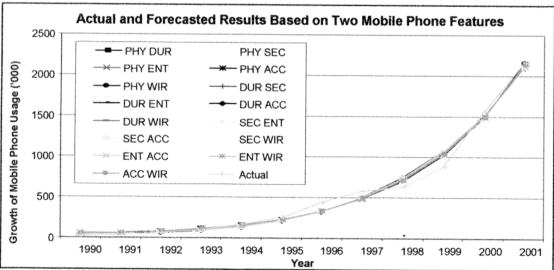

Figure 6.3: Comparison of Actual and Forecasted Results Based on Two Mobile Phone Features

To understand the accuracy of the forecasted results, several measures of forecast accuracy can be used. These include mean error (ME), mean relative error (MRE) and mean magnitude of relative error (MMRE) (Doggett, 2002). The ideal forecasts would produce a situation where the ME, MRE and MMRE values are zero.

The ME is the average distance between the actual data points and the predicted values. From the results, if ME is greater than zero, the overall forecasts have a downward bias, whereas, if ME is less than zero, the overall forecasts have an upward bias. ME values, which are non-zero, yield cumulative errors (Fenton and Pfleeger, 1997). Overall, in this research, the results of ME indicate zero or negative values (Table 6.5). The formula for calculating ME is shown in equation (1). The mean relative error (MRE) is calculated as the average of relative error (RE). The formulae for RE and MRE are shown in equation (2) and (3), respectively. It is possible for negative relative errors to balance out positive ones. Hence, the absolute value of the error should be considered. The mean magnitude of relative error (MMRE) is thus calculated using the absolute value of RE. MMRE is used to define the prediction quality. If the MMRE is small, then the predictions are generally good (Fenton and Pfleeger, 1997). The formula for MMRE is shown in equation (4).

$$\mathbf{ME} = \frac{1}{n} \sum_{i=n}^{i=0} (\text{actual result - forecasted result}) \tag{1}$$

$$\mathbf{RE} = \frac{(\text{actual result - forecasted result})}{\text{actual result}} \tag{2}$$

$$\mathbf{MRE} = \frac{1}{n} \sum_{i=n}^{i=0} (\text{RE}) \tag{3}$$

$$\text{MMRE} = \frac{1}{n} \sum_{i=n}^{i=0} | \text{RE} | \qquad (4)$$

Table 6.5 shows the results of the measurement of forecasting accuracy between the actual and the forecasted results. The values of MMRE are between 0.10 and 0.43 for one feature. The results are most accurate for physical attribute (90%), and it is least accurate for accessibility (57%) for forecasting based on one feature. The values of MMRE are between 0.20 and 0.35 for two features. The results are most accurate for physical attribute and accessibility (80%), and it is least accurate for durability and accessibility (65%) for forecasting based on two features.

Table 6.5: Error Measurements between Actual and the Forecasted Results (1990-2001)

Feature	Error Measurement				
	ME	RE	MRE	MMRE	Accuracy
PHY	0.00	-0.08	-0.01	**0.10**	90
DUR	-21.64	1.81	0.15	0.41	59
SEC	-18.68	2.00	0.17	0.39	61
ENT	-9.75	2.26	0.19	0.32	68
ACC	-25.56	1.51	0.13	**0.43**	**57**
WIR	0.00	0.70	0.06	0.13	87
PHY DUR	0.00	-1.41	-0.11	0.21	79
PHY SEC	0.00	-1.45	-0.12	0.21	79
PHY ENT	0.00	-1.56	-0.13	0.22	78
PHY ACC	0.00	-1.36	-0.11	**0.20**	80
PHY WIR	0.00	-1.69	-0.14	0.23	77
SEC DUR	0.00	-2.26	-0.18	0.32	68
SEC ENT	0.00	-2.01	-0.16	0.28	72
SEC ACC	0.00	-2.41	-0.19	0.34	66
SEC WIR	0.00	-1.49	-0.12	0.22	78
DUR ENT	0.00	-1.98	-0.16	0.28	72
DUR ACC	0.00	-2.33	-0.2	**0.35**	65
DUR WIR	0.00	-1.51	-0.12	0.22	78
ENT ACC	0.00	-2.04	-0.17	0.29	71
ENT WIR	0.00	-1.60	-0.13	0.22	78
ACC WIR	0.00	-1.44	-0.12	0.21	79

Keys:
PHY: physical attributes   DUR: durability   SEC: security
ENT: entertainment   ACC: accessibility   WIR: wireless solution

Table 6.6 shows the accuracy of the forecasted results based on the number of past years' data used. In this research, the maximum number of past years' data used is twelve years (1990 - 2001). The minimum number of past years data that need to be used in this forecasting model is four years. Generally, a minimum of three sets of data are needed to determine a regression model with two independent variables (Crown, 1998). The levels of accuracy based on one and on two mobile phone features shown in Table 6.6, were calculated based on the formulae discussed in the previous section. The results show the impact of the fast-changing purchasing preference due to the advancement in S&T.

Table 6.6: Accuracy of the Forecasted Results Based on the Number of Past Years' Data Used

Feature		Number of Past Years' Data Used								
		4 (1998-2001)	5 (1997-2001)	6 (1996-2001)	7 (1995-2001)	8 (1994-2001)	9 (1993-2001)	10 (1992-2001)	11 (1991-2001)	12 (1990-2001)
PHY		95	91	89	90	87	85	87	85	90
SEC		94	88	85	85	82	74	69	65	59
DUR		93	88	85	86	81	74	68	64	61
ENT		95	92	89	90	89	89	88	74	68
ACC		94	88	85	84	81	73	66	62	57
WIR		95	92	91	89	89	89	90	86	87
PHY	DUR	94	93	94	89	87	86	84	82	79
PHY	SEC	94	93	94	89	87	86	84	82	79
PHY	ENT	94	92	94	89	87	85	83	81	78
PHY	ACC	94	93	94	89	87	86	84	83	80
PHY	WIR	94	92	93	89	87	85	83	80	77
DUR	SEC	95	93	94	88	86	83	78	73	68
DUR	ENT	94	92	94	89	87	85	86	78	72
DUR	ACC	95	93	94	88	86	83	78	73	65
DUR	WIR	94	92	94	89	87	85	83	80	78
SEC	ENT	94	92	94	89	87	85	83	78	72
SEC	ACC	95	93	94	88	86	83	78	73	66
SEC	WIR	94	92	94	89	87	85	83	80	78
ENT	ACC	94	92	94	89	87	85	83	77	71
ENT	WIR	94	92	93	89	87	85	83	80	78
ACC	WIR	94	92	93	89	87	85	83	80	78

Keys:
PHY: physical attributes   DUR: durability   SEC: security
ENT: entertainment   ACC: accessibility   WIR: wireless solution

Figures 6.4 – 6.5 show in line graphs, the accuracy of the forecasted results based on the number of past years' data used. Overall, the level of accuracy increases as the number of past years' data used in the forecasting decreases. In this study, the highest accuracy obtained was based on four past years' data (1998 – 2001). This is due to the fact that there is a shift in the preference of features of users. However, for forecasting model used in other aspects such as growth of literacy level in the Malaysian society (Zaman, 1998), this may not be true. The larger number of past years data used, the more accurate the forecasting results (Nash and Nash, 2001).
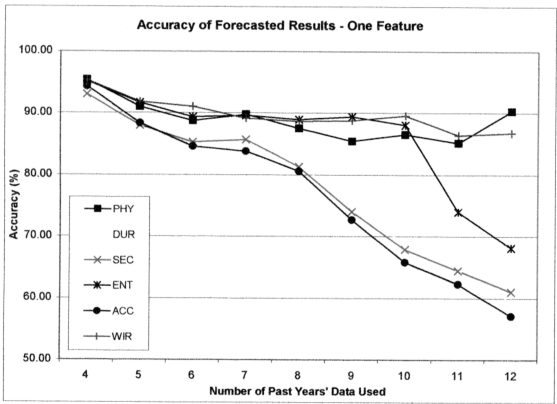

Figure 6.4: Accuracy of Forecasted Results Based on the Number of Past Years' Data Used
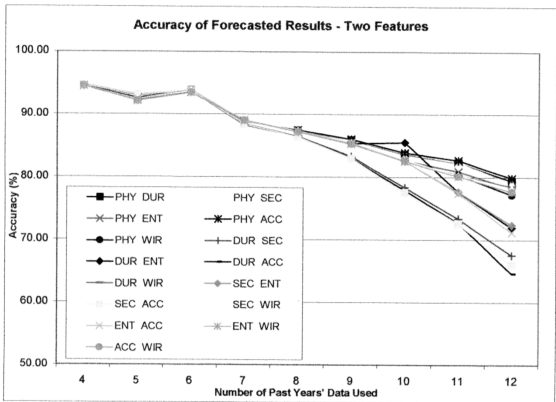(One Mobile Phone Feature)

Figure 6.5: Accuracy of Forecasted Results Based on the Number of Past Years' Data Used
(Two Mobile Phone Features)

Indeed, in any forecasting model, it is unlikely to achieve hundred per cent accuracy. In this research, other factors such as government policies, economic stability and the price of mobile phone also impact on the number of subscribers and the growth rate of mobile phone usage. The forecasting models established in this research, however, are able to forecast the trend of mobile phone usage growth and growth rate resulting from the advancement in S&T in the mobile phone industry. This could help the related industries, which include the mobile phone manufacturing companies, telecommunications companies and mobile phone distributors to focus on the most significant advancement in S&T features that contribute to the highest growth of mobile phone usage to achieve better returns.

Based on Table 6.7, the actual preference and the forecasted preferred mobile phone features show similarity. It is obvious that the difference between the percentage of the features with highest accuracy and the percentage for the most preferred features are between zero and three. This difference can be considered fairly small. Hence, the results are considerably accurate.

For forecasting based on the past six years' data, the difference based on one mobile phone feature is zero per cent, whereas, the difference based on two mobile phone features is one per cent. Hence, the most preferred feature(s) are not the same as the forecasted preferred feature(s) when two mobile phone features are considered.

From this study, it can be inferred that the forecasted results based on past four, five and six years' data achieved more than 90 per cent accuracy for both one and two mobile phone features (Figures 6.4 – 6.5). Hence, the data that produce the most accurate forecast results would be within six years. It is obvious that the forecast results achieve higher accuracy if a minimum of four past years' data are used in the forecast model, as mentioned above.

Table 6.7: Comparison of Actual and Forecasted Preference

No. of Past Years' Data Used	Actual Preference		Forecasted Results					
	Based on One Mobile Phone Feature	Based on Two Mobile Phone Features	Based on One Mobile Phone Feature (% of Forecasting Accuracy)			Based on Two Mobile Phone Features (% of Forecasting Accuracy)		
			HA	MP	D	HA	MP	D
4 (1998-2001)	WIR	PHY and WIR	1. PHY 2. ENT **3. WIR** (95)	WIR (95)	0	1. DUR and SEC 2. DUR and ACC 3. SEC and ACC (95)	PHY and WIR (94)	1
5 (1997-2001)	WIR	PHY and WIR	1. ENT **2. WIR** (92)	WIR (92)	0	1. PHY and DUR 2. PHY and SEC 3. PHY and ENT 4. PHY and ACC 5. DUR and SEC 6. SEC and ACC (93)	PHY and WIR (92)	1
6 (1996-2001)	WIR	PHY and WIR	**1. WIR** (91)	WIR (91)	0	1. PHY and DUR 2. PHY and SEC 3. PHY and ENT 4. PHY and ACC 5. DUR and SEC 6. DUR and ENT 7. DUR and ACC 8. DUR and WIR 9. SEC and ENT 10. SEC and ACC 11. SEC and WIR 12. ENT and ACC (94)	PHY and WIR (93)	1
7 (1995-2001)	WIR	PHY and WIR	1. PHY 2. ENT (90)	WIR (89)	1	1. PHY and DUR 2. PHY and SEC 3. PHY and ENT 4. PHY and ACC **5. PHY and WIR** 6. DUR and ENT 7. DUR and WIR 8. SEC and ENT 9. SEC and WIR 10. ENT and WIR 11. ENT and WIR 12. ACC and WIR (89)	PHY and WIR (89)	0
8 (1994-2001)	WIR	SEC and WIR	1. ENT **2. WIR** (89)	WIR (89)	0	1. PHY and DUR 2. PHY and SEC 3. PHY and ENT 4. PHY and ACC 5. PHY and WIR 6. DUR and ENT 7. DUR and ACC 8. SEC and ENT **9. SEC and WIR** 10. ENT and ACC 11. ENT and WIR 12. ACC and WIR (87)	SEC and WIR (87)	0
9 (1993-2001)	WIR	SEC and WIR	1. ENT **2. WIR** (89)	WIR (89)	0	1. PHY and DUR 2. PHY and SEC 3. PHY and ACC (86)	SEC and WIR (85)	1
10 (1992-2001)	WIR	SEC and WIR	**1. WIR** (90)	WIR (90)	0	1. DUR and ENT (86)	SEC and WIR (83)	3
11 (1991-2001)	WIR	SEC and WIR ACC and WIR	**1. WIR** (86)	WIR (86)	0	1. PHY and ACC (83)	SEC and WIR ACC and WIR (80)	3
12 (1990-2001)	WIR	ACC and WIR	1. PHY (90)	WIR (87)	3	1. PHY and ACC (80)	ACC and WIR (78)	2

Keys:
HA: Highest Accuracy   MP: Most Preferred Feature   D: Differences (HA- MP)

6.4   SUMMARY

This chapter highlights the user evaluation and the accuracy of the forecasting models. A user evaluation was carried out using the questionnaire survey. The accuracy of the forecasted results generated by MPID was determined by comparing the actual growth of mobile phone usage with the forecasted results for the years 1990-2001. The accuracy of the forecasted results, for both one and two mobile phone features based on past four, five and six years' data, is more than 90 per cent.